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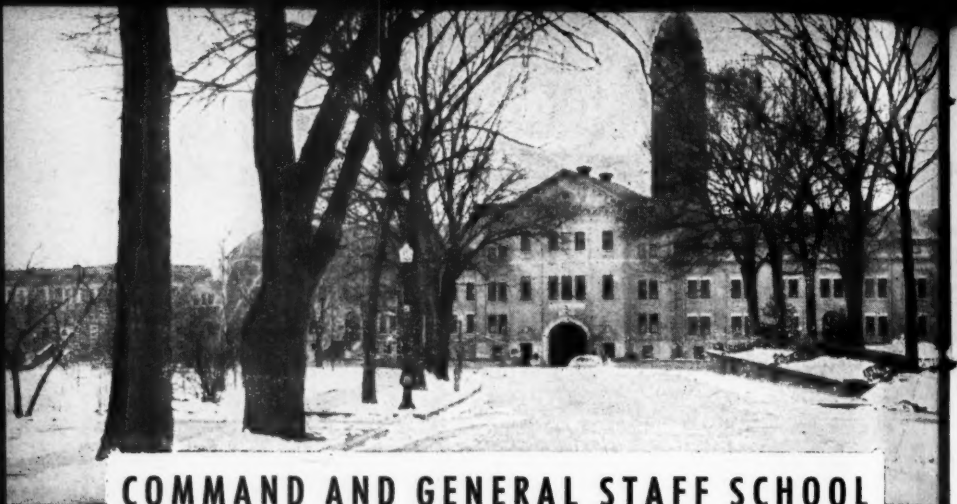
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Wartime Developments in War Department Organization and Administration

Digested from an article by Major General Otto L. Nelson, Jr.

IN terms of organizational changes and administrative developments, the war did to the War Department about what one would expect—shook it up and changed it to a point where it is scarcely recognizable to its intimates of pre-war days.

Wartime demands for prompt action and the compelling necessity for the coordination of global military operations forced fundamental changes in the organizational structure and administrative procedures of the War Department. It was not that the old organization could not assimilate increased numbers, for it could have done so with little change. There were many organizational forms and departmental procedures which had demonstrated their merit over a long period of years and which were capable of serving wartime needs. Alterations in the pre-war organizational structure had to come to facilitate rapid action, to improve coordination, and, above all, to make the most of that fleeting factor, time, when there was so much to be done and so little time available in which to do it.

Organization of the Joint and Combined Chiefs of Staff

One of the most significant changes induced by war needs was the establishment of the Joint and Combined Chiefs of Staff and their supporting agencies in December 1941. The Joint Chiefs of Staff provided the medium to resolve the top military and related political and economic problems of the United States. Designed primarily to bring the Army and Navy chiefs together, they also facilitated the transaction of business between the military and the other executive departments of the government in those fields closely related to the war effort. By admitting the military representatives of the Allied governments, the Joint Chiefs of Staff transform themselves into the Combined Chiefs of Staff.

The essential elements of the Joint Chiefs of Staff organization are:

1. The Joint Chiefs of Staff, consisting of the Chief of Staff to the Commander in Chief of the Army and Navy, the Chief of Staff of the U.S. Army, the Chief of Naval Operations, and the Commanding General of the Army Air Forces. Formal meetings are usually held weekly. An agenda is prepared for these meetings and well-documented and thoroughly prepared papers reduce random discussion and pave the way for prompt action.

2. The Joint Chiefs of Staff Secretariat, with an officer of the Army and an officer of the Navy as secretary and deputy secretary, and an administrative staff consisting of Army, Navy, and civilian personnel. The office is well integrated, and no distinction is made in assignment of jobs because of branch of service.

3. Joint Chiefs of Staff committees. Each committee operates under a charter approved by the Joint Chiefs of Staff and consists of Army and Navy officers, who in many instances also have important assignments in a related activity in the War and Navy Departments. As a rule, there is a committee for each specific field or area in which the Joint Chiefs of Staff are interested. Thus, there are committees on logistics, administration, transportation, production, and strategy, to name a few.

The organization of the Combined Chiefs of Staff follows the same pattern as that of the Joint Chiefs of Staff. The only difference is the addition of representatives of the Allied Nations to each element of the Joint Chiefs of Staff organization. Thus, when the representatives of the Allied Nations are added, the Joint Administrative Committee becomes the Combined Administrative Committee. The Joint and Combined Chiefs of Staff organizational arrangement makes it possible for questions to be considered first on a strictly national basis and then on an Allied basis and has the merit of using the same representa-

tives from the Army and Navy to serve in a dual capacity.

Perhaps the most significant contribution of the Joint and Combined Chiefs of Staff organization is that it has provided top-level planning for the entire war effort. The various Joint and Combined Chiefs of Staff committees are excellent planning agencies, and the entire organization has been designed to emphasize the planning function. The organization is such that there is no possibility for the planning committees to become operating agencies. After the decision has been made by the Joint or Combined Chiefs of Staff, the execution or implementation of an approved plan or directive becomes a responsibility of the War or Navy Department or of an overseas commander. This inability to operate has contributed greatly to the excellence and single-purposeness of the planning function.

An important characteristic of the Joint and Combined Chiefs of Staff organization is to be found in the combination of the committees. This can best be explained by an example. For instance, the Army members of the Joint Logistics Committee are, by design, the key logistics officers in the War Department. The head of the Logistics Group in the Operations Division of the War Department General Staff, the head of the Plans and Operations Division in the Army Service Forces, and the key officer on logistical planning in the Army Air Forces, with their counterparts in the Navy Department, make up the Joint Logistics Committee. It is thus possible for them, when the need arises for a subcommittee, to staff it with officers who are working on this problem in their jobs in the War or Navy Department. Thus, the opportunity is provided for a vast amount of preliminary work to be done within the War and Navy Departments, in order to obtain first of all a complete treatment of the problem along comparatively narrow lines. The Army Service Forces representative can be relied upon to develop his side of the problem; the Army Air Forces representative, the air side; and the representative from the operations division of the War Department General Staff will stress the operational or strategical aspect. The same

kind of treatment occurs in the Navy Department. Then the Army representatives determine the Army position while the same process is occurring in the Navy Department to establish the Navy view. In an appropriate subcommittee, or in the Joint Logistics Committee, the air, ground, sea, and supply views of the problem are put together. The opportunity is present to resolve at the lowest practicable level differences which might exist in the various viewpoints. By informal methods the working members can ascertain the views of their respective superiors. At this level difficulties can be surmounted and disagreements resolved with comparative ease. This is in sharp contrast to the difficulty experienced in reconciling diverse views when each separate opinion is processed through the various echelons to the highest level, and the attempt then made to secure agreement after a firm position has been taken by the interested parties.

When a Joint Chiefs of Staff committee completes its work on a project, a report in the form of a formal paper is made to the Joint Chiefs of Staff. The subject then becomes a proper question for decision by the Joint Chiefs of Staff, and the paper is placed on the agenda of a formal meeting.

The Joint Chiefs of Staff and the Combined Chiefs of Staff organization has facilitated greatly the transaction of interdepartmental business of a military nature among the various executive departments of the United States Government. Likewise, the machinery has facilitated the handling of complex military questions involving the Allied Nations.

The War Department Reorganization of 1942

The War Department reorganization of March 1942 was no less important than the establishment of the Joint and Combined Chiefs of Staff organization. The purpose of the reorganization was to effect necessary decentralization and to reduce greatly the number of individuals reporting directly to the Chief of Staff. Pursuant to Executive Order No. 9082, Circular No. 59 was published on 2 March 1942. Since then this terse circular of ten pages has supplied the guiding princi-

ples and basic organization under which the War Department has functioned. Authority to act upon matters relating to the training of the ground combat arms—infantry, cavalry, field artillery, coast artillery, tank destroyer, and armored force—was delegated by the Chief of Staff to the Commanding General of the Army Ground Forces. To the Commanding General of the Army Air Forces was delegated the responsibility to procure and maintain equipment peculiar to the AAF and to provide AAF units properly organized, trained, and equipped for combat operations. The Commanding General of the Services of Supply (now the Army Service Forces) was given the mission of providing services and supplies to meet military requirements, except those peculiar to the AAF. Under the Commanding General of the Services of Supply were grouped the supply services—ordnance, quartermaster, engineers, medical, signal, and chemical warfare; and the administrative bureaus—finance, adjutant general, chaplain, and judge advocate general. Certain field commands, such as corps areas [now service commands], ports of embarkation, and other miscellaneous activities, were placed in the Services of Supply. Thus the number of individuals directly responsible to the Chief of Staff was reduced sharply. The commanding generals of the three major commands, the commanders of overseas theaters, and the assistant chiefs who head the five War Department General Staff divisions report direct. By this reduction in the span of control of the Chief of Staff, the reorganization permitted the Chief of Staff to concentrate on the broad aspects of planning and developing the military program and to guide the strategic conduct of war. The War Department General Staff developed and coordinated policy; the overseas commanders and the commanding generals of the three major commands in the United States carried out policies and strategic directives under very wide grants of authority.

Such was the urgency for speedy action that the reorganization intentionally overemphasized decentralization and the delegation of authority to subsidiary echelons. It

was possible to solve many questions at lower organizational levels, and the transaction of War Department and Army business was greatly expedited. Because of the degree of decentralization, there had to be some sacrifice in the degree of coordination to be obtained.

With the establishment of the Army Ground Forces, Army Air Forces, and Army Service Forces in March 1942, the War Department General Staff divisions were freed from the strain of pressing day-to-day operations and were able once again to return to their planning and coordinating activities.

To coordinate military operations, the reorganization included the establishment in the War Department General Staff of an Operations Division, which replaced the War Plans Division. Here was placed the responsibility to transmit and to coordinate all the instructions and directives for the conduct of military operations which were sent to the various overseas theaters and to the defense commands in the United States. The Operations Division became the central agency in the War Department through which all instructions to overseas theaters had to be channeled. By monitoring all incoming and outgoing messages from and to theaters, the Operations Division made certain that a theater request did not go unanswered and that conflicting instructions were corrected. In the strategy and policy group of the Operations Division there was established the required staff assistance to prepare the necessary strategical directives for the Chief of Staff.

Staff Supervision

Staff supervision by the War Department General Staff has always been subject to varying interpretation. The planning role of the staff has always been accepted, but there has always been a disposition to question the extent of its supervisory role. With the establishment of the three major commands in the United States, and with the prominence of the overseas theaters, the tendency has been for the War Department General Staff to respect the command prerogatives of the commander concerned and to accept the philosophy that commanders will comply with War Depart-

ment directives. Where special conditions have arisen, and where it has appeared likely that the commander concerned might have difficulty in implementing a directive, War Department General Staff supervision has been extended to the point necessary to obtain a close check on performance.

Early in the war it became necessary to initiate staff supervision to make sure that troop units going overseas were adequately trained and equipped. The Deputy Chief of Staff was given the responsibility of personally approving the clearance of every unit prior to overseas shipment. It was therefore necessary to establish a system of supervisory controls in which the Inspector General played a most important part. The system required that a status report, describing the conditions of the unit, be submitted by the commanding general of the major command responsible for the training of the unit. This report listed: the pertinent information concerning the unit, such as the efficiency rating of the unit commander; a summary of the training that had been given; the percentage qualifications of the unit in the weapons which had to be fired; a statement that the training required by mobilization regulations had been completed; and a statement that all required equipment was on hand or that it would be furnished on a certain date. These reports were excellent, but because they were made by the commander who was responsible for the training, it was considered desirable to obtain the comments of a disinterested agency. For this reason, it was required that an officer of the Inspector General's Department spend several days with the unit in order to make a detailed inspection, on the basis of which an independent report was submitted. The report indicated all deficiencies which had been observed in the unit and ended with a statement that the unit was or was not qualified for overseas shipment. The status report which was submitted by the responsible major command and the report of the Inspector General were then considered at the same time, and together they furnished the infor-

mation necessary to make a decision to approve the shipment of the unit overseas or to require that it be deferred in order to make further training possible.

The wartime shortage of manpower was responsible for the establishment of another General Staff agency whose primary duty was staff supervision. In order to exploit all opportunities to save on manpower, the War Department Manpower Board was established in Washington with field sections in various parts of the United States. The board reports directly to the Chief of Staff, and is given free rein in making manpower surveys to ascertain where personnel savings can be made. After surveying a number of the same type of installations throughout the United States, the War Department Manpower Board sets up a yardstick which it uses as the basis for personnel manning in a given type of installation. It then applies that yardstick and submits recommendations on personnel economies which, in its opinion, can be made.

It is proper that staff supervision by War Department General and Special Staff agencies should be relatively limited. The three major commands have developed many more staff agencies to exercise staff supervision. Significant examples of these are the Management Control Division of the Army Air Forces and the Control Division of the Army Service Forces. These divisions have as their principal functions the analysis of existing procedures and organization, and the inauguration of improvements to increase efficiency. Their contributions in introducing improved administrative procedures and in carrying out work-simplification programs in many areas have been particularly outstanding.

Unsolved Problems

It would be wrong to assume that the War Department has no unsolved problems in organization and administration and that all agencies operate at optimum efficiency. Only in wartime was it possible for substantial change to occur, and this fact emphasizes what might be termed the dif-

ficult role of the innovator in public administration.

While wartime changes were always easy to make, the fact remains that change was the rule and the *status quo* the exception. The principal officers in the War Department

not only were willing to try new methods but also inspired subordinates with a zeal to effect improvement. It is to be hoped that the advantages of that condition will become so apparent that it will be—as it was not before—continued in peacetime.

Air Personnel and Training

THE time has passed when the Air Staff can be composed exclusively of command pilots. It must have officers who have mastered the production skills of scheduling materials and synchronizing the flow of industrial components. A modern air staff without industrial technicians is as obsolete as a Model T Ford.

The qualifications of the combat commander determine to a larger extent than any other single element the effectiveness of a unit in combat. The science of screening and classifying personnel must accordingly be utilized in such selections to the greatest extent possible.

The complexities of future wars and the interrelationships of the several branches of the armed forces require that joint training be begun early in an individual's career and progressively strengthened.

Detailed and moment-by-moment knowledge of all aspects of civilian and military activity within the territory of an enemy or a potential enemy is essential to sound planning in times of peace or war. Continuous knowledge of potential enemies, covering their entire political, social, industrial, scientific and military life is also necessary to provide warning of impending danger.

Strategic air warfare can be neither soundly planned nor efficiently executed without a continuous flow of detailed information of this kind. In the future it will be suicidally dangerous to depend upon reports of military attachés and routine or casual sources of information regarding foreign states.

We can no longer set up "military characteristics" for a new weapon or airplane, award a contract, and expect to have a finished article delivered which can be put into use immediately. The entire process from development through production, training and operational use is a continuous one. Specialists must be at hand to give intelligent guidance at every turn. This will require adjustments in the military organization to provide for a group or corps of full-time scientists in uniform, and adjustments to provide adequate compensation for highly qualified civilians.—General of the Army Henry H. Arnold in his "Third Report of the Commanding General of the Army Air Forces to the Secretary of War," 12 November 1945.

Submarine Warfare

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THE average citizen of the United States possesses only the vaguest sort of idea of what a powerful weapon the modern submarine is. He knows that the Axis powers, during the years of 1939 to 1943, were very close to success in their efforts to strangle the flow of munitions and aid from North America to the British Isles and Russia, and that the U-boat played a major role in those efforts. He realizes that, had this sea blockade of the European members of the United Nations not been overcome, the Axis would have been victorious. In the Pacific, he also realizes, but without any clear picture of how and why, that United States submarines were one of the most important factors in the collapse of Japan. If he is old enough to remember World War I clearly, he further recalls that Germany, in that war, came perilously close to knocking out Great Britain in 1917 with the same undersea weapon. But his concept does not go beyond this shadowy and inadequate recognition of the tremendous potentiality of the submarine in modern warfare. Confront him with the fact that the submarine in its fifty years of existence has had as far-reaching and drastic an impact upon *every field of warfare* as has its more spectacular cousin, the airplane, and his reaction will be one of startled incredulity. Yet that fact has been incontestably established in the two world wars of this century.

Failure to appreciate the full significance of modern submarine development is not confined to the layman. Military personnel themselves have been slow to perceive the fundamental nature and the terrible potency of the undersea threat; indeed, even at this late date, it is clearly recognized by only a relatively few members of our armed forces. In these days of ballyhoo of the airplane and the atomic bomb, the submarine is widely pooch-pooched as a lethal weapon; yet it is fully as destructive in the hands of an international gangster as either of the former or both of

them in combination. Its employment is accomplished by less fanfare than attends strategic bombing, and the full effects of large-scale submarine attack are not so immediately apparent to the public at large; yet the grip of effective undersea war upon the throat of a belligerent nation can be more surely fatal than can any rain of bombs. Factories, stockpiles, and war industry can go underground and thereby escape, in large measure, from aerial bombardment; but shipping cannot evade the deadly submarine by any such means. In World War II, enemy submarines accounted for some seventy-five per cent of *all* Allied shipping sunk. The best estimate is that they sent over fifteen million tons to the bottom. In 1940 and 1941, the Axis submarine campaign was far closer to accomplishing the defeat of Britain than was the much-vaunted Luftwaffe air assault upon English cities and ports. Had Hitler been successful in U-boat interdiction of the transatlantic shipping routes, the collapse of the British Isles and European Russia would inevitably have been followed by establishment of Axis beachheads and bases in the Western Hemisphere and an all-out assault upon the United States. Under that attack, combined with the Japanese pressure from the west, it is doubtful if America could have survived.

These are facts of the most vital significance to every American, be he soldier, sailor, or civilian. They are fraught with meaning particularly for the professional military upon whose technical advice rests the country's future military security. We have been lucky twice, in that the U-boat war was not built up rapidly enough by the enemy to bring him victory before we could amass sufficient counterstrength to hold his campaign in check; but on each of these two occasions the margin by which we escaped disaster was terribly close. If a third world war should come, it will most certainly be featured by unrestricted submarine warfare on a grand

scale from the instant the first shot is fired or bomb dropped. Any nation so attacked, which has in the past followed democratic "Pollyanna" policy with respect to readiness to meet the submarine menace, will find its shipping completely throttled from the outset. To the United States, paralysis of her shipping would mean swift invasion by the enemy. Surely we have learned the lesson that to keep war from our own soil we must meet and destroy its threat across the ocean. Shipping is the first essential for that purpose.

The basic concept of submerged attack

could be done. However, with the practically simultaneous inventions of the lead-acid storage battery, the electric motor, and the Whitehead "automobile torpedo" in the late years of the nineteenth century, these handicaps were overcome and the development of the submarine received tremendous impetus immediately. In 1888, almost as if by starting signal, the navies of the world powers embarked on their first serious submarine-building programs. The first vessels produced were tiny ships of primitive characteristics and severely limited capacity. Progress was



The U.S.S. *Cabrilla*. (Official U.S. Navy photo.)

upon ships is as old as history. Aristotle recorded a crude form of submarine assault by Greek soldiers during the siege of Tyre in 332 B.C. During the next twenty-two hundred years, countless ingenious ideas were advanced and a considerable number of experimental devices whose purpose was submerged and invisible approach to destroy shipping were actually built. All of these suffered from two grave drawbacks which effectually forestalled their receiving serious consideration in naval warfare, viz., the lack of machinery propulsion for the craft while submerged, and the necessity for the submarine to progress right to the point of contact with the hull of the intended victim before any damage

swift, however, and improvements multiplied themselves so rapidly that by 1914 the new weapon had been established as a necessary, albeit minor, feature of any first-class navy.

In World War I, the U-boat was suddenly spotlighted as the most efficient commerce raider ever devised. Almost overnight, the type skyrocketed from its former lowly position in the social scale of strategy into that of a greatly feared and respected weapon of major importance. Great Britain, in April 1917, was brought to the very doorstep of defeat, with but six weeks' supply of food left in the entire British Isles, a condition for which the undersea warfare was solely responsible. Technological improvements, par-

ticularly in propulsion and communicating equipment, which transformed the German subsurface raiders from small coastal boats into ocean-going war vessels of high speed and tremendous striking power, also opened the door upon an almost endless vista of new tactical possibilities for the type.

After the Armistice in 1918, every major power proceeded with energetic survey and exploitations of these new fields of operation. Today, the submarine can penetrate enemy waters, destroy shipping and attack shore installations, observe, photograph and report on enemy activities and defense, and lay deadly mines, all under circumstances in which *no other agency in existence* can do so. In sea warfare of today, no ship of any flag or any class, war or merchant, dares leave the shelter of harbor nets without taking extraordinary precautions against subsurface attack during every minute that she is at sea. This is true of every square mile of ocean on the surface of the earth. Modern submarines can and will reach and infest every spot in the world which is accessible by water. Even harbor nets and defensive mine fields are not sure protection against them. The sinking of the British battleship *Royal Oak* by a German U-boat *inside* Scapa Flow in October 1939, and the Japanese midget-submarine penetration of Pearl and Sydney harbors in 1941 and 1942, respectively, bear graphic witness to this fact.

It is worth repeating that had not the United States' aid and reinforcement been forthcoming when it was, Germany would have brought England to her knees in 1917 and again in 1941-1942. In the grand politico-strategy of both wars, the Germans made the fatal error of "banking on" United States lethargy and refusal to be embroiled. Had not that assumption been wrong both times, the German U-boat fleet would have been the weapon which defeated the British Empire. The point of major significance therein lies in the fact that had the Kaiser in 1914, or Hitler in 1939, built up a larger U-boat force at the outset, a German victory would have resulted *before* this country could have tipped

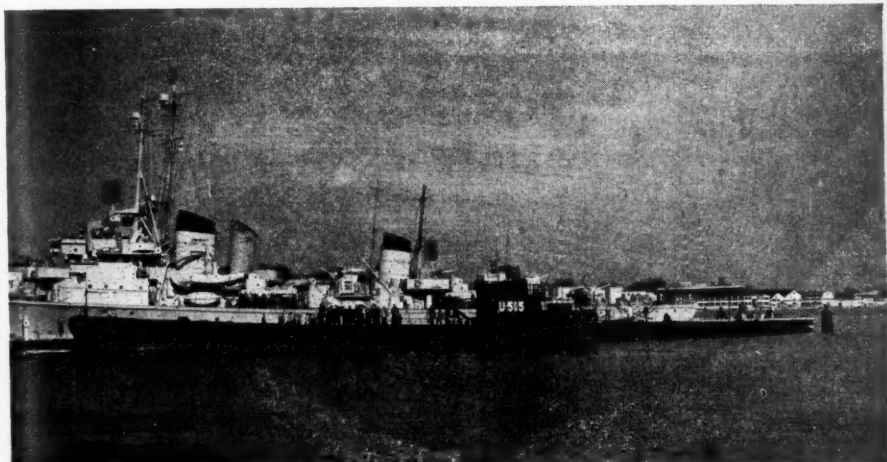
the scales in democracy's favor. The German undersea fleet at the start of World War I comprised only twenty-eight boats of small size and little striking power. Early and completely unforeseen successes were achieved by these, of which perhaps the most striking was the "grand slam" sinking by the U-9 of three British cruisers within a period of one hour. This startling victory was largely responsible for Germany's turning to the U-boat as her major sea weapon, so that, in actuality, she very nearly won the first world war with a weapon whose value she had not yet perceived when she opened her attack, and whose development was consequently hasty and unplanned.

It is a strange commentary upon German strategy that she, in large measure, repeated this stupidity in World War II. It is probable that she had not over seventy-five small submarines when she struck again in 1939. True, she built up this force as rapidly as possible *thereafter*, but had she devoted the pre-war resources of her naval-building installations to U-boats, instead of to futile construction of a few large surface vessels like the *Bismarck*, she might well have commenced her campaign with an undersea force in the neighborhood of 300 strong. With such a fleet, there can be little doubt that she would have won the European war before the end of 1941. As it was, December 1941 found her with approximately 225 submarines in service and an equal number under construction. With these, in the first six months of 1942, she sank three and one-half million tons of shipping at a cost of less than fifty U-boats. United Nations' ships were going down faster than they were being replaced, while German submarines were being built at three times the rate at which they were being destroyed! However, this peak of German performance was reached only after two and a half years of war instead of at the beginning of hostilities. The American ship-building expansion was thirty months along its hard road to the full production figure of thirteen million tons annually which it attained in 1943. Likewise, new antisubmarine weapons

and tactics were developing rapidly, and the golden opportunity of the first two years of the war had slipped through Hitler's fingers. But, blessed as Britain and the rest of us were by this fundamental Nazi blunder, the margin of her survival was so narrow that she was, at one point in 1942, down to a total food reserve of only three weeks!

The instrument with which the "master

1,600 tons displacement, and the speed of the three smaller classes was increased in improved versions of them. All the types except the "250-tonners" were capable of sustained operations at sea, and as far from Europe as the east coast of the Americas and the coasts of Africa. The development of the "sea cows"—supply submarines to replenish fuel, food, and torpedoes in the combat boats—further



German submarine U-505. (Official U.S. Navy photo.)

race" has twice come thus close to succeeding in world conquest is relatively unimpressive to the layman's eye. The German submarine of World War II was small by conventional standards, cost relatively little, and was adaptable to mass and prefabricated construction. The various classes carried crews of from about twenty to fifty men. Originally of double hull construction to withstand the pressure of deep submergence, in the later years of the war they appeared with single hulls to simplify production and economize on materials; but they were all capable of withstanding great depths up to 600 feet or more. Initially, three distinct classes were produced: of 250 tons, 500 tons, and 700 tons surface displacement, respectively. Later, two larger types were added, of 1,060 and

added to their endurance. The smallest class carried three or four bow torpedo tubes, a light antiaircraft battery for protection, and a supply of spare torpedoes. All the larger boats (500 tons and above) carried torpedo tubes in both bow and stern, a medium-caliber deck gun, and a strong antiaircraft battery. A number carried mines as well. They were able to make between eighteen and twenty knots on the surface and, for short periods, a maximum of eight knots submerged. All were equipped with efficient underwater sound-detection gear, echo-ranging apparatus, and superb communicating equipment. In one respect, however, their equipage was surprisingly deficient; for the submarines were not outfitted with the best in radar, and the Germans do not appear to have grasped



Japan's "Boneyard Bay"—Kure Harbor.

In foreground, Japanese midget submarines with giant cargo-carrying submarines behind them. (Official U.S. Navy photo.)

the great possibilities of its use by U-boats. Certainly, the highly effective use of radar by the United Nations' antisubmarine forces was not only one of the prime factors in the final defeat of the U-boat, but also was a surprise to the Nazis.

In the last two years of the war, two new and ingenious developments appeared in the Axis undersea fleet. These were the *Schnörkel* tube device, by means of which submarines could lie submerged for periods of many days, and the *Walter* closed system of submerged-ship propulsion. The *Schnörkel* was essentially a flexible air tube with a floating upper

end. Although its use gave the submarine greatly increased immunity from air attack, and, theoretically at least, greatly increased submerged endurance, in practice it had many grave shortcomings. Perhaps the worst of these was the fact that the tube could not be designed and used so as to guarantee against the fouling of the air in the ship under service conditions. Since the end of the war, top German naval officers have stated that a number of their U-boats were lost due to this alone. The *Schnörkel* was not a success in its first form and the device was withdrawn from active use in 1944, pending further improve-

ments in design. The *Walter* closed-induction engine made its debut in experimental ships in service in 1944. The boats so fitted did not employ the conventional storage-battery electric-motor drive for submerged propulsion, but were equipped, instead, with internal-combustion engines operating on hydrogen and oxygen, carried in heavy pressure bottles in the ship. The first models were relatively crude and actually possessed no real advantages over the electric-drive ships; however, from the outset, it was clear that the new system required only some further refinement to make it far superior to the old one. This Nazi invention was being feverishly worked on right up until VE-day. Happily, all the "bugs" had not been eliminated in time for it to make its impact felt in the closing months of the conflict. But, in both the *Schnörkel* and the *Walter* lie the germs of a revitalized submarine menace in any future war. The latter device, particularly, is already of sufficiently-proved effectiveness to cause authoritative students of naval warfare to predict, for the near future, submerged speeds as high as twenty-five or thirty knots and submerged endurance *at those speeds* of ten to twelve hours. The entire technique of antisubmarine warfare, as we now know it, would be outmoded completely by such vessels.

The Germans are popularly considered to have brought the art of modern undersea attack to its highest peak of effectiveness. There is much justification for this belief—certainly it was they who first resorted to unrestricted sinkings and who introduced the dreaded "wolf pack" tactics in the Atlantic—

but it would be a mistake to think that they held a monopoly in the field. United States submarines in the Pacific did more to break the back of Japan's empire than did surface ships and airplanes combined. Of a total of some nine million tons of shipping on hand, captured and built to 1945, Japan had left a pitiful total of 861,000 tons when she surrendered. Her shipping was her lifeblood, and her veins had been completely drained by its destruction. Of the eight million tons sunk, our submarines alone are credited with between five and five and one-half million—well over twice as much as was destroyed by air attack. The United States submarine force at the time of Pearl Harbor comprised 112 ships. During the war some 180 were added and 51 were lost; at the close of hostilities we possessed 239 vessels. They are larger than the German ships, are more powerfully armed, and are capable of longer independent patrols; but otherwise they differ little from the enemy craft. In the Pacific, distances were far greater and the hunting was not so lush as that presented to the Germans in the Atlantic; yet, in a period of two years shorter, our submarines, averaging a total strength of less than 200 units, sank one-third as much shipping as did the far more numerous Nazi. We paid for our score with the loss of 51 submarines; the European Axis lost between 775 and 800 of theirs. By an ironic twist of fate, one-half of the criminal axis, Japan, was thus brought to book primarily by the very weapon which her partner, Germany, had first conceived and used in modern war.

The successful army of today is composed of specialists, thoroughly trained in every detail of military science, and above all, organized into a perfect team.

—General of the Army George C. Marshall

Duties of an A-4

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LITTLE has been written concerning the specific duties and functions of the A-4 officer in a tactical air headquarters. To be sure, his duties are similar to those of a G-4 as listed in FM 101-5; but there are certain differences in the relative importance of these duties to those two logistics staff officers, and A-4's position is somewhat altered and infinitely complicated by the existence, in some form or another, in every overseas air force of the Air Force Service Command [AFSC] or a component thereof.

To begin the discussion, let us first take a look at the G/A-4's duties.

Duties and Functions

In FM 101-5 it is set forth that the G/A-4 has at least twenty-five specific duties. G/A-4 is responsible for advising his Commanding General in all matters related to these duties. He is responsible for making a continuous estimate of the administrative situation, and for the presentation of the conclusions of this estimate to the commanding officer, orally or in writing, at any time. The conclusions and recommendations as drawn by the G/A-4 are necessary to the Commanding General in making his own estimate of the situation and subsequent decision. The Commanding General must consider his capabilities in the light of the conclusions drawn from G/A-4's estimate, and must consider further the possible effect on his capabilities of any alternate plans that G/A-4 may present. It is not until the Commanding General has arrived at his decision that G/A-4 can go ahead with the detailed administrative plan. Sometimes these steps do not follow each other as they have been given, and sometimes the whole process is carried out mentally, right up to the actual plan itself. Regardless of this fact, each of these steps is accomplished prior to the Commanding General's final decision.

It is also apparent that G/A-4's functions in connection with his many duties involve particularly "the planning for and super-

vision of activities concerning" the twenty-five duties abovementioned. Since the words "planning" and "supervision" are related to each of these several duties, it is well to examine a little more closely exactly what they connote. "Planning" is not a rare and unfamiliar process peculiar to the military profession. Housewives plan dinners; architects plan houses; politicians plan campaigns; surgeons plan operations. Even golfers plan their next stroke. Planning is the methodical arrangement of the various means believed to be necessary in the attainment of an objective; it is the devising of ways and means of accomplishing something. Well, just what does the G/A-4 wish to accomplish? His desire is to have readily available to the troops the supplies and facilities they may need to fly a sortie, fight a battle, or win a war. Hence, he must methodically arrange the various means necessary to effect the adequate and timely delivery of such supplies, or to establish the facilities where they will be available to the fighting soldier. Since some of these supplies are thousands of miles away, the methodical arrangement of the means for delivering them must begin months prior to the time they will be needed. Other supplies, such as winter clothing, may be months distant in point of time, but G/A-4 must begin in midsummer to concern himself with their delivery. Planning, then, with reference to G/A-4, combines the best features of crystal-gazing and business management. *Prior planning is the essence of G/A-4's efforts.*

And what about supervision? One cannot eat a meal that is merely planned; it must also be cooked. One cannot live in a house that exists only on a blueprint: it must be built. This does not mean that the architect himself must go out and apply the mortar to the bricks or the hammer to the nails. But, if he expects the completed house to resemble in any way the beautiful drawing he has made, he must visit the site of the construction frequently and check to make sure that

the bricklayers and carpenters and plumbers not only understand what he means for them to do, but that they are actually doing it, and doing it on time and in the right place. This is supervision. Similarly, a G/A-4 must constantly visit his supply and evacuation installations and check with the personnel operating them to insure that the plans that he has devised are being carried out. A plan is no better than its execution, and the execution can be no better than the supervision. If for no other reason, G/A-4 should observe the workings of his plans so that he can improve on them. In this connection, information furnished by the statistical control officer is an invaluable aid to an A-4 in checking his plans.

As you have already realized, the foregoing remarks apply with equal force to both the G-4 and the A-4. But there are aspects in which the functions of the G-4 and those of the A-4 differ. These differences arise chiefly from types of supplies and the facilities available for handling them. For example, G-4 is not concerned with the hundreds of thousands of items peculiar to the airplane and its maintenance; nor is he concerned with any type of supplies which are expended at the relative rate of items such as aviation gasoline or bombs. Generally speaking, the supplies with which G-4 is concerned are expended at a fairly constant rate, or in any case, the fluctuation is not likely to be as great. Those with which A-4 is concerned have an extremely variable rate of expenditure. If the weather is good on Tuesday, millions of gallons of gasoline and millions of pounds of bombs may be expended; but if the weather is bad on Wednesday, practically no gasoline or bombs will be used. If the air target this week from B-29 bases in China is, say, Hong Kong, relatively much more bomb tonnage than gas tonnage will be consumed; if the target next week is Tokyo, the ratio of bombs to gas may be completely reversed. If an airborne operation occurs this month, hundreds of gliders may be damaged or destroyed. If there is no airborne operation next month, the loss in gliders will be negligible. These extreme fluctuations in rates

of expenditure, plus the differences in the characteristics of the supplies themselves, account for the major differences between the G-4's and the A-4's duties.

There are differences, too, in the way in which an A-4 will handle such matters as evacuation. Since an air force or a tactical air command, complete with all its subordinate units, is usually located in the communications zone, or possibly in the army service area, Air Corps casualties originate in this area and are turned over to any army or communications zone medical installation after passing through only one, or at most two, medical installations under Air Corps control. Even combat casualties who return from missions in aircraft usually land in the communications zone or army service area. In contrast to this, we have the G-4 of an army, corps, or division, who has to make provisions for the handling of casualties from the front lines all the way back through each medical echelon to the communications zone hospital.

If you are familiar with the work of an AFSC, you may by now have begun to wonder just what is the relationship between that headquarters and the A-4 of a tactical air headquarters. Since in some air force headquarters the A-4 and the Commanding General of the AFSC are one and the same person, there is obviously considerable similarity in the two jobs. Though one person may fill both positions, the jobs are not identical. The A-4 is the architect who designs the house; the Commanding General of the AFSC (or his A-4) is the contractor who builds it. Both must plan and both must supervise, but their relation to the completed house is separate and distinct. The A-4 of the Air Force draws the picture, making sure that the structure will serve the purpose for which it is intended, and that it blends and fits in with the surroundings. The AFSC is responsible for obtaining the materials and personnel to build the structure, and for the actual construction in accordance with A-4's design. One man may be both the architect and the contractor; but the jobs themselves are quite different. The A-4 of the AFSC does not need

to know why twice as much gasoline will be needed at Field "A" on 16 July, as long as he sees that the gasoline is delivered. The Air Force A-4, on the other hand, has planned to have the gasoline there because he knows that an additional squadron is being staged out of Field "A" on 16 July. It may be of no concern to the Air Force A-4 whether the gasoline is hauled by the 21st Quartermaster Truck Company or the 22d Quartermaster Truck Company, but the A-4 of the AFSC may decide to use the 21st Quartermaster Truck Company because their drivers are known to be more familiar with the road. The office of the A-4 of an air force is *not* one of record, and he has no functions of command as does the Commanding General of the AFSC.

The duties of A-4 may be discussed for purposes of clarity under four headings: first, those concerning supplies and equipment; second, those concerning individual soldiers and service organizations; third, those concerning service installations and facilities; fourth, those concerning administration.

A-4's duties in connection with supplies include procurement, storage, transportation, distribution, location, maintenance, repair, and salvage. To exemplify these specific duties, let us take one item of supply and follow it through all of its relations to these duties of A-4. For this purpose, we will take a P-47 droppable wing-tank and the A-4 of an overseas air force.

Many months before the wing-tank is placed on an airplane, the A-4 must begin to worry about it. He must first concern himself with its procurement: that is, he must check with the AFSC to see that arrangements have been made for the wing-tank to begin its journey to his particular air force. He must next assure himself that when it arrives it is properly stored until it is needed. If it must be distributed by the Air Force General Depot to an air service group, A-4 must coordinate with the AFSC because he is responsible for the wing-tank's being at the right place when it is needed, and he must know its location. A-4 does not lose interest when the tank becomes attached to the airplane. He must have established certain maintenance policies

which will insure that the wing-tank will not deteriorate. He probably was responsible for the policy of the modification of the P-47's to receive this tank—unless they were so equipped before arrival at the air force. Should this tank become damaged, proper maintenance facilities should be at hand; and should it become obsolete or damaged beyond repair, its salvage should have been prearranged by A-4 so that a minimum of wastage will occur.

Now wing-tanks are pretty important items, but they constitute only one of several hundred thousand items of air corps supply. Air corps supply is only one of the many classes of supply with which A-4 is concerned. Others include automotive supplies, construction supplies, medical supplies, ordnance supplies, signal supplies, and quartermaster supplies. This list is mentioned not to impress you with how hard an A-4 works, but to point out that any planning or supervision which an A-4 undertakes must be comprehensive. The A-4 may make a perfect plan regarding the wing-tanks and may supervise it with extreme care; but if he has not also arranged for the companion supplies and parts for P-47 airplanes to be on hand at the same time, both he and the wing-tank might as well have stayed at home. Similarly, the wing-tank and the other parts and supplies may be readily available; but if all the service personnel are sick in bed because medical supplies have failed to arrive or because A-4 has neglected some of his other duties, then the A-4 is in trouble.

In addition to the duties in connection with supplies and equipment, A-4 has certain duties in relation to individual soldiers. He is responsible for the planning and supervision of hospitalization and evacuation for all of the personnel in his particular organization. When the unit for which he is the A-4 has its own hospitals, as in the case of the air forces in this country and certain of the air forces overseas, the A-4 must plan their location, movement, and functioning, so that they may provide proper medical care for all the sick and wounded of the command. He is responsible for the movement of patients from the

place where they become sick or are wounded to the place of treatment. If the evacuation is to be by air, the A-4 is concerned not only with the movement of personnel of his own command, but with the movement of personnel from all the arms and services of our own forces, of our allies and prisoner-of-war patients.

For service organizations (as distinguished from combat units), A-4 is also charged with recommendations for their assignment and movement. As in the case of A-1, the problem for A-4 involves getting the right man and the right job together. The movement of service personnel must be so arranged by A-4 that it does not interfere with the movement of combat troops, and yet enables the service personnel to be in a position to support the combat troops by performing the particular service in which they are specialized.

Supplies, individual soldiers, and service organizations are not the only concerns of the A-4. He is also responsible for the planning and supervision of service installations and facilities. The most common service installations and facilities with which an A-4 has to deal are: bases, warehouses, shops, shelter, and roads; but in certain unusual circumstances he may even have to do with docks, military railroads, and inland waterways. The A-4's duties in connection with these service installations and facilities include acquisition, location, construction, operation, maintenance, improvement, repair, and disposition. Take an air base, for example. A-4 must plan to acquire the necessary site in the proper location; he must arrange its construction with the Engineer; he must plan for its maintenance and improvement by the use of service personnel; he must have arranged for speedy repair, if enemy bombs have damaged the air base; and finally, when the war moves forward and the air base is no longer needed, A-4 may be called upon to dispose of it.

A-4 has another set of duties in addition to those related to supplies, individual soldiers, service organizations, and service facilities. This last group of duties can be assembled under the heading of administra-

tion. It includes the matters of property responsibility, funds and expenditures, traffic control, and last but not least, the preparation, authentication, and distribution of administrative orders.

The planning and supervision necessary for property responsibility is quite variable, depending on whether the command is within the continental United States or overseas. It also varies from theater to theater and with the level of the particular A-4's staff. But, regardless of the location of the command, the man who must keep all the units informed, and in conformity, is the A-4.

It was mentioned as an example that A-4 must plan for the acquisition of air bases. Some air bases are acquired by capture, and obviously this comes more in A-3's line. Many air bases are acquired by lease or by purchase of the site, and these are "right up A-4's alley." The money involved in such an acquisition constitutes an example of A-4's concern with funds and expenditures. Such expenditures must be carefully planned, so that they and all other expenditures for land, buildings, construction, transportation, machines, and labor can be "squeezed out" of the funds allotted to the command. The officer responsible for such planning and "squeezing" is, of course, the A-4.

Traffic control is the third administrative function charged to the A-4. In some situations traffic control can hardly be considered a problem at all. There is a certain island in the Southwest Pacific that is just long enough to accommodate a fighter strip and just wide enough to hold the strip and four rows of tents out of the water. Since there were at one time only air corps troops on the island, the whole problem of traffic control fell on the shoulders of the A-4. However, there was only one road on the island eleven hundred yards long, so the problem was really not very difficult to solve. In other situations as, for example, around a large intransit depot, traffic control can be as difficult as it is on Long Island on a Sunday afternoon. While the A-4 does not have to borrow a whistle and direct the trucks himself, he must make plans so that the traffic moves in an orderly and expeditious

TYPICAL FUNCTIONAL ORGANIZATION OF A-4 SECTION, AIR STAFF

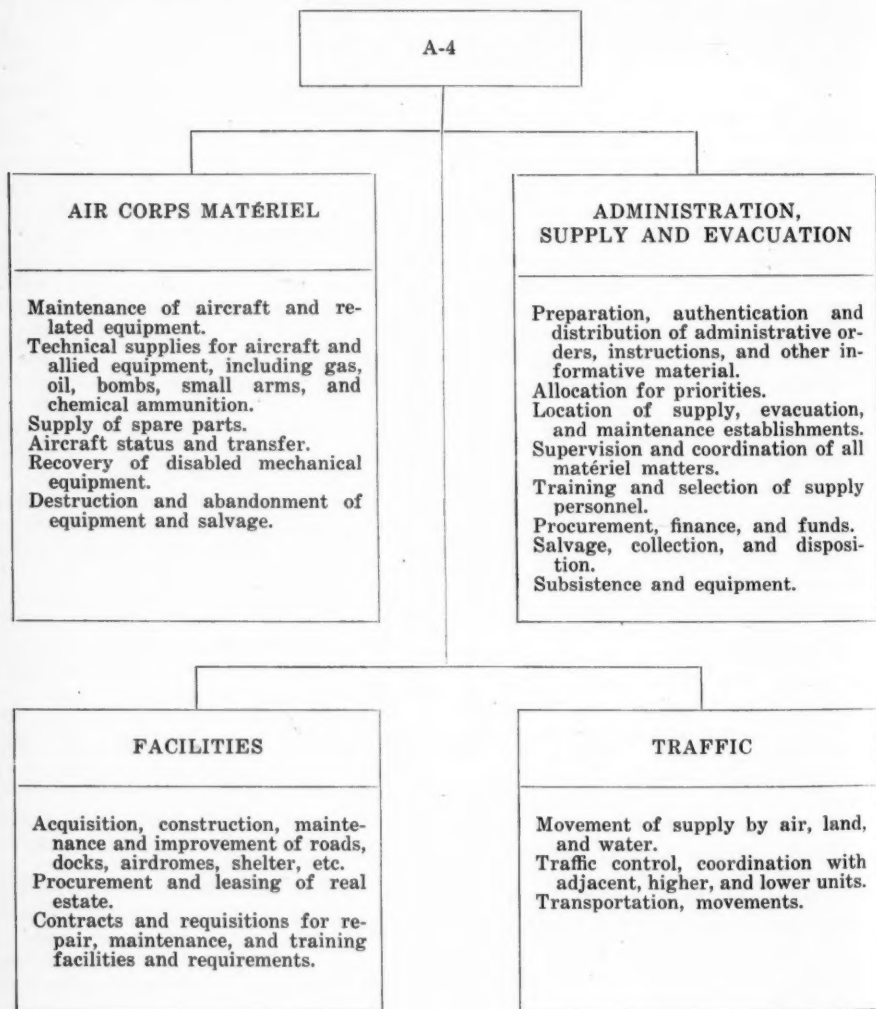


Figure 1.

fashion. There was one case in New Guinea where A-4 and A-1 even went so far as to have summary court officers installed in little booths at traffic intersections to bring quick justice to offenders.

The Logistics Section of any headquarters is responsible for the preparation, authentication, and distribution of administrative orders. To be sure, certain parts of these orders are prepared and submitted to G/A-4 by the Personnel Section (G/A-1), but the responsibility for the compilation of the information to go into the order, its issue, and its alteration or supplementation is up to G/A-4.

G/A-4 normally maintains an up-to-date logistical plan, concurrent with tactical operations. From this plan, at any given time, an administrative order may be drawn.

Organization of the A-4 Section

Since A-4 has certain duties and functions (involving planning and supervision) which are concerned with supplies and equipment, the individual soldier, service organization, service installations and facilities, and administration, let us see how an A-4 would organize his section to accomplish these duties. There is no fixed or set method of organizing an A-4 section. However, there are two important determining factors which must guide the A-4 in setting up his organization: one is the job to be done, the other is the personnel available.

If the job to be done is large, it will require a large section; if the job is small, the A-4 section will be correspondingly small. The job to be done depends on whether the command is located in an active theater, a base command, or the zone of the interior. Obviously, the A-4 of a command in the zone of the interior will not need nearly as many people for planning and supervising the supply of bombs and ammunition as will the A-4 of a command in an active theater of operations. The job to be done also depends on the part of the world in which the command is located. An A-4 in the Pacific may have needed a large subsection to plan and supervise sea transportation, but such a sub-

section would have been of no use to an A-4 deep in France. Other factors governing the A-4's job to be done are the type of command and the staff level at which the A-4 is operating. The A-4 of a reconnaissance wing will not have to do with the supply of bombs or the establishment of bomb dumps, both of which would be of vital concern to the A-4 of a bomber command. In a fighter wing, the A-4 would rarely lie awake nights worrying about the stock levels in the various air force general depots, but the same problem might put gray hairs in the head of the A-4 of an air force or AFSC.

Not only does the job to be done affect the way the A-4 section will be organized, but the personnel available is an important determining factor. Both their number and their qualifications must be considered. A bombardment-wing A-4 section is authorized two officers and five enlisted men. It would hardly be advisable, then, for the A-4 to plan an organization of three main sections, each with two subsections. But the A-4 of an AFSC, Special, with sixteen officers, one warrant officer, and twenty-five enlisted men, could organize three or four main sections, each with several subsections.

Having discovered that both the job to be done and the personnel available exert a marked influence on the organization of the A-4 section, we may take a look at the various types of organization after which our new A-4 might attempt to model his section. Two typical organizations are shown in Figures 1 and 2. Figure 1 shows one type of functional organization. In it the various duties of the A-4 have been grouped under four functional headings and assigned to specific subsections of the A-4 office. Another version of a functional organization might group these duties differently: for example, under such headings as (1) Administration and Troop Units, (2) Hospitalization and Evacuation, (3) Traffic and Transportation, and (4) Supply and Maintenance. Or the A-4 may desire to have only two subsections and divide all the duties between an Administrative and Service Section and a Supply and Engineering Section.

A-4 SECTION (A/O&E 1-800-1)

A-4 OFFICER — COLONEL

1. Advises CG on supply and maintenance.
2. Coordinates supply matters with theater G-4 and ASF.
3. Maintains information as to status and location of supplies of ASF and AAF.
4. Maintains very close coordination with A-3.
5. Supervises supply and maintenance operations within the command.
6. Supervises supply, evacuation, and maintenance planning within the command.

ASST A-4 OFFICER — LT COLONEL

1. Assists the A-4 officer and during his absence is in charge of the section.
2. Handles all Adm details.
3. Coordinates incoming and outgoing correspondence.

ADM SUPERVISION —CAPTAIN

Assistants: 1—WO
1—M Sgt
3—S Sgt
2—Sgt
2—Cpl
4—Pfc &
Pvt

1. Handles all routine paper work.
2. Checks all correspondence and keeps section files.
3. Maintains suspense files on all projects.
4. Handles personnel problems.
5. Coordinates actions of other sections.

SUPPLY OFFICER —MAJOR

Assistants: 1—Capt
1—2d Lt
1—T Sgt
2—S Sgt
1—Sgt
2—Cpl
1—Pfc

1. Maintains data on supply availability.
2. Maintains liaison with other staff officers and supply officers of higher and lower echelons.
3. Keeps tactical units informed of Adm plans.
4. Handles allotment of funds.
5. Coordinates acquisition of building sites and airdromes.

MAINTENANCE OFFICER—MAJOR

Assistants: 1—1st Lt
1—T Sgt
2—S Sgt
1—Sgt
1—Cpl
1—Pfc

1. Maintains technical data on aircraft and equipment.
2. Prepares for issue necessary technical directives for operation of aircraft and equipment.
3. Promotes work on special projects for improvement of aircraft, maintenance facilities, and maintenance conditions.

Figure 2.

In each T/O&E that carries an A-4 section there is a suggested method of organizing the section, which is indicated by the job titles given to the assigned personnel. For example, Figure 2 gives the organization of the A-4 section suggested by T/O&E 1-800-1. Actually, the possible types of organizations are limited only by the imagination of the A-4 and the wishes of his Commanding General. And the Commanding General will probably approve any organization which balances the personnel available against the job to be done.

What about the qualifications of the personnel? Suppose we have four officers, in addition to the A-4, assigned to the A-4 sections. O'Reilly has had four years' experience in administration; Branelli has had six years' experience in all types of supply, Schwartz has worked several years as a technical inspector; and Jones is a recently-grounded combat pilot. The sixty-four dollar question is: Will A-4 set up an organization like that in Figure 1 or will his staff resemble the lower half of Figure 2? Obviously, he needs to set up a simple type of section with about four subsections.

The Importance of Coordination

No general staff section can function properly if it climbs up into its little ivory tower and ignores the rest of the general and special staff. When a part of a human being does that, we call him a schizophrenic and start sweeping out the padded cell. An A-4 who attempts it would probably face a similar fate. To avoid that an A-4 must coordinate with the rest of the general and special staff. Before we go any further, it might be a good idea to clarify what we mean by coordination. It is simply a matter of meshing the gears with the rest of the staff so that the whole machine runs. A gear wheel spinning merrily off by itself may be clicking off RPM's at a phenomenal rate, but it is getting nowhere in the world until it meshes with the rest of the gears in the machine. The A-4, as a member of the general staff, is one of the biggest gears in this staff machine, and if he does not mesh with the other big gears, A-1, A-2, and A-3, and with the

gears of the special staff, the machine will not run. How does this meshing or coordination take place? It is really very simple. Suppose A-4 plans to use a certain service group in a new location. He coordinates with A-1 by telling him of the plan and finding out if the unit is up to strength in personnel and high in morale. He coordinates with A-2 by telling him of the plan and asking his advice on keeping the move a secret from the enemy. He coordinates with A-3 by telling him the plan, by checking the status of the group's training, and by requesting A-3 to prepare the movement orders. Then the A-4 meshes with the other gears. He checks with the Engineer to be sure any necessary construction or drainage in the new area has been completed. He checks with the Ordnance Officer as to whether there is a bomb dump already at the new site or the service group will have to take bombs with them and establish a dump. Also he checks with the Ordnance Officer to be sure the group has enough trucks in condition to make the move. He checks with the Surgeon: What are the health conditions in the new area? Will the group need mosquito bars? Should they take atabrine? He checks with the Signal Officer: Are telephone or radio facilities already in operation at the new location, or will they have to be established? He checks with the Quartermaster: Does the service group have enough rations on hand for the tactical units they must supply, or will they have to obtain more? Will their trucks need more gas and oil than they have on hand? Other aspects of the movement might require checks with the Adjutant General, Chaplain, Chemical Officer, Finance Officer, Inspector General, Judge Advocate General, and Provost Marshal.

All of these checks, all of these questions, all of these answers, constitute coordination. Without it, the staff machine will not run. Suppose the A-4 neglects to find out from the Ordnance Officer that the service group in question has fifty per cent of its trucks deadlined. That means that the group will arrive at its destination long after A-4 expected to be servicing two tactical groups. Suppose A-4 neglects to ask the Surgeon

about mosquito bars: it may mean that two or three weeks later half the group is not available for duty because of malaria or dengue. The classic example of failure to coordinate is contained in the very old proverb that goes:

For the want of a nail the horseshoe was lost,
For the want of the shoe, the horse was lost,
For the want of the horse, the rider was lost,
For the want of the rider, the message was lost,
For the want of the message, the battle was lost,
For the want of the battle, the kingdom was lost,
All for the want of a horseshoe nail.

Summary

In summary it might be said that we have seen that the versatile A-4 must plan like a cook, supervise like an architect, and coordinate like a gear wheel. His duties con-

cern all activities in connection with all classes of supply. They concern the individual soldier by virtue of A-4's responsibility for hospitalization and evacuation, and for the movement and assignment of service organizations; they concern the functions of service installations and facilities; and they concern administrative features in relation to property responsibility, funds and expenditures, traffic control, and the preparation of administrative orders. To perform these duties, A-4 needs a section in which the personnel available is balanced against the job to be done. And to keep from spinning his wheels, he must mesh gears with the remainder of the general staff and with the special staff.

Integration of Air Power Into National Defense

THE greatest lesson of this war has been the extent to which air, land, and sea operations can and must be coordinated by joint planning and unified command. The attainment of better coordination and balance than now exists between services is an essential of national security.

Unity of command is not alone sufficient. Unity of planning, unity of common item procurement and unity of doctrines are equally necessary. In addition, ground, naval and air forces must each have an equal voice as well as an equal responsibility in all plans and policies. Maximum efficiency and economy cannot be attained when one type of force is subservient to another in planning or operational councils. The full capabilities of the subservient force will never be exploited efficiently and serious blunders are bound to follow.—*General of the Army Henry H. Arnold in his "Third Report of the Commanding General of the Army Air Forces to the Secretary of War," 12 November 1945.*

Radar

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RADAR has been a very hush-hush subject. Now we can reveal what an important adjunct to modern warfare it has become during this war. It is a well-known device for seeing through darkness, fog, and clouds, and beyond the range of the human eye. As such, it has been used not only

can thus be read. If the searchlight can then be turned on instantaneously and the time interval measured between the light going out and the reflection coming back, the range can be determined by multiplying one-half the time interval by the speed of light. Having range, elevation, and azimuth,

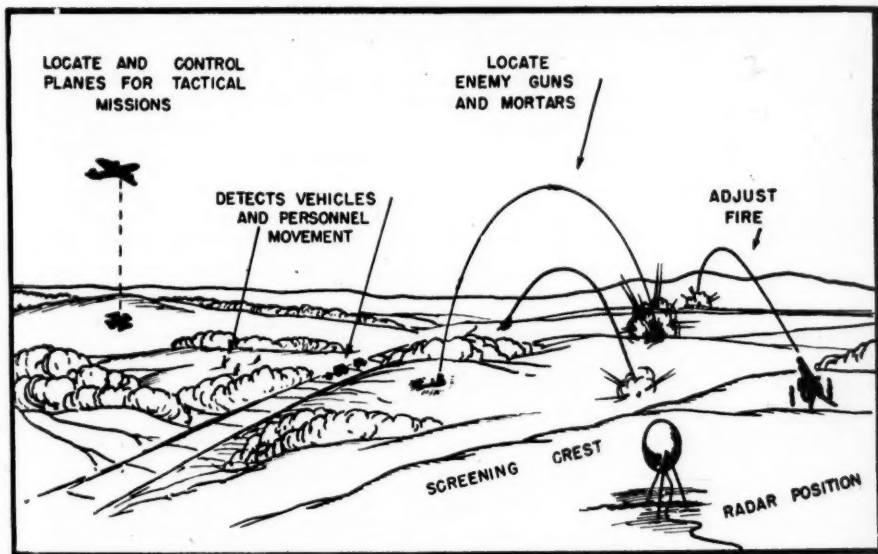


Figure 1.

for and against planes and ships but also for and against targets of the artillery. (Figure 1.)

How does radar find the desired targets?

The principle on which radar functions is fairly simple. Think of a searchlight beam moving back and forth over an assigned sector. A target carrying a mirror enters the beam and the light is reflected back and centered in a telescope mounted on an instrument which has already been oriented. The azimuth and elevation to the reflector

the target can be fixed or located. If this process is repeated several times, it is quite simple to plot the position of a target or to determine the course of a plane, a ship, or a projectile.

Let us briefly consider the basic employment of radar in the air and on the sea before considering the more recent ground-role application.

Defense Against Aircraft

Modern defense against aircraft attack requires that the presence, height, bearing,

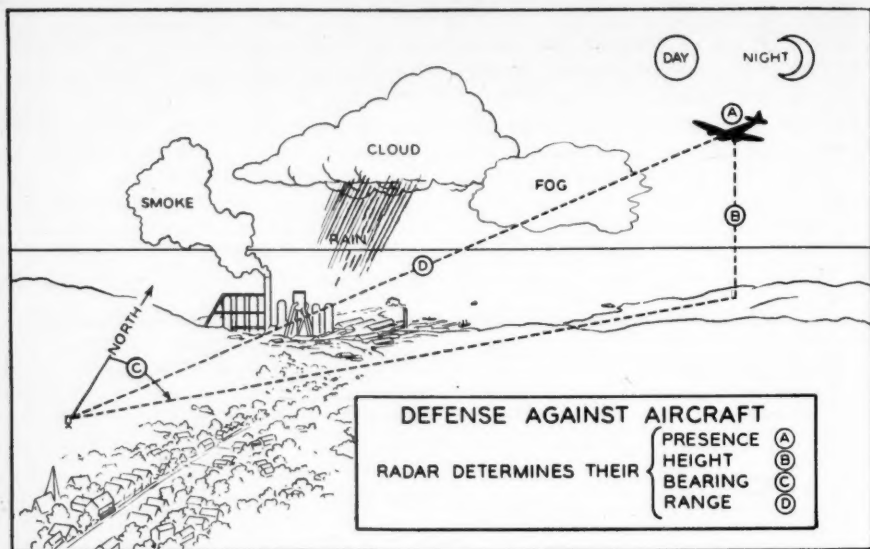


Figure 2.

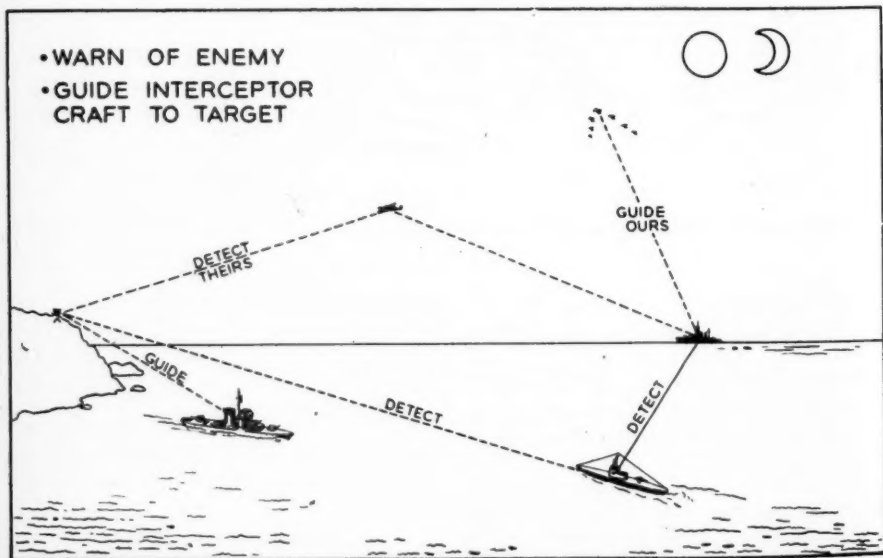


Figure 3.

and range of hostile airplanes be made known long before the airplanes can be seen or heard. (Figure 2.) This knowledge must be available irrespective of atmospheric conditions; fog, clouds, or smoke during the day or night must not interfere with the detection of hostile aircraft. Radar has provided a source for such information, and at the same time has opened new fields for greatly improving traffic control and safety for both airplanes and ships.

Long-Range Reporting or Search

Reporting is accomplished by fixed or shipborne stations constantly searching a specific area to warn of enemy attack. Information from such stations is recorded continuously. The data are used to guide interceptor craft toward an enemy target. (Figure 3.)

Gun Laying or Fire Control

Radar sets capable of determining with a high degree of accuracy the range, bearing, and elevation of the enemy target when

within firing range are used for the control of land-based defense equipment, such as searchlights, antiaircraft batteries, and coastal batteries. Similar radar sets aboard ships are used for fire control, for anti-aircraft, secondary, and main batteries. In such applications the data must be formulated rapidly and accurately. (Figure 4.)

Airborne Use

Portable equipment is used in patrol aircraft to search for the presence of enemy targets; and in combat aircraft to locate the target, and for fire control. The equipment may be designed for the detection of aircraft, surface vessels, or submarines. It may also be used as an aid to navigation to determine the course or position in relation to a home beacon station. (Figure 5.)

Identification

It is possible to use auxiliary equipment with radar to determine whether an echo has come from a friendly or enemy craft.

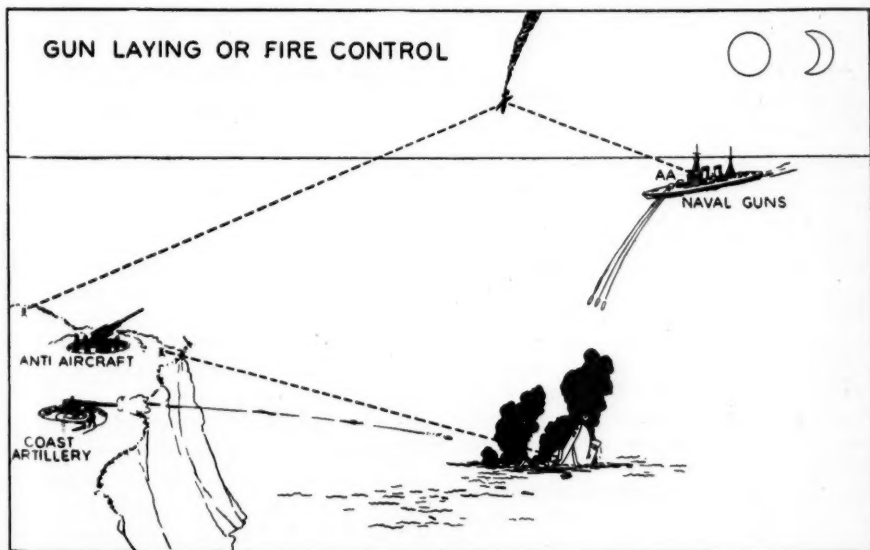


Figure 4.

Artillery Radar

One of the most important functions of artillery is the location of profitable targets. When the importance of radar as an aid in target location was suggested, Major General Orlando Ward, then Commandant of the Field Artillery School, ordered an investigation of the possible uses of radar for field artillery. Within twelve months, radar as

A projectile can be located at several points along its trajectory. Hence it is possible to determine where it came from and where it is going. Therefore, enemy guns can be located and friendly fire can be adjusted by radar.

Counter-Mortar

The casualty figures caused by enemy mor-

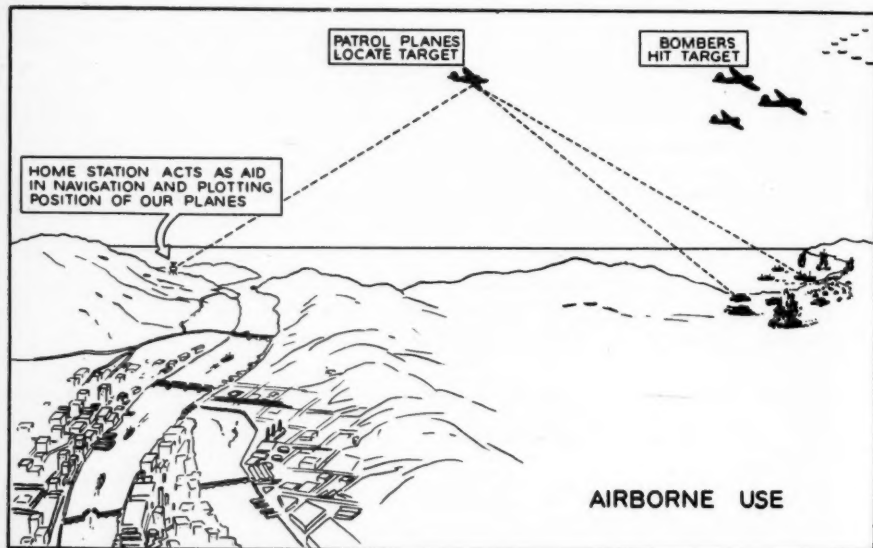


Figure 5.

applied to artillery has become a regular feature of the Field Artillery School instruction.

The location of a ground target can be determined in several ways. One method is by reading on a plane at the exact time that it passes over the target. The plane can also be guided to specific locations by directions from the radar operator on the ground. Effective bombing can be conducted by a radar operator guiding the bomber to an accurately-located target. Targets can be located on the ground when they act as a better reflector for the radar beam than the surrounding countryside.

tars leave no doubt as to the importance of radar in a counter-mortar role. The artillery radar section works very closely with the counter-mortar agencies of the infantry through artillery liaison channels. The range of radar allows the most efficient operation from the general position area of the field artillery battalion. The counter-fire potentialities are readily available there, as are the communication and survey facilities of the artillery. A radar officer at division artillery headquarters will insure proper coordination of all radar counter-mortar agencies through artillery communication channels.

Limiting Factors

When working with radar, the limitations must be fully understood and remembered.

There are several factors which can prevent proper operation of a radar set. The most significant of these is improper maintenance. The radar personnel must be skilled in checking and repairing the equipment as well as in operating it. Replacement units, spare parts, and test equipment must be available at all times. One burnt-out tube, condenser, resistor, or other part will probably incapacitate the whole radar section.

Weather has a pronounced effect on radar detection ranges. The effect of weather on radar detection range capabilities varies with different types of radar sets. Sets with a high transmitter frequency are affected more by weather conditions than those with lower

frequencies. Heavy rain will interfere with most sets.

Physical obstructions will always present problems to radar. Radar waves will not penetrate mountains, hills, land masses, forests, or man-made obstructions such as concrete, metal roofs, or wire screening. The area on the opposite side of the obstruction is invisible to radar detection.

Conclusion

Remember that radar is an important branch of the technical and scientific aspect of modern warfare. *It takes time and extensive schooling to prepare men to handle these specialized equipments properly.* We must also be prepared to deal with the enemy if he should be so equipped. To take full advantage of radar, *research must be continuous in all branches to improve present equipment and techniques and to develop new uses.*

The Prince Rupert Support of Embarkation

Development of a virtually new supply route to Alaska and the North Pacific, cutting squarely across Western Canada, can now be made known. Springing up right after Pearl Harbor, it hinged on a halibut and salmon center and port of the Canadian Northwest, on the British Columbia coast forty miles below the southern tip of Alaska. That port is Prince Rupert, British Columbia.

The Prince Rupert Support of Embarkation, a large U.S. Army installation, was located here, cutting many sea-miles from the "road to Tokyo" and offering additional facilities by which the Pacific gap to the Orient in general and to Alaska in specific could be breached.

The Prince Rupert Support of Embarkation contributed no small share to the building of the Alaska Highway, Canol Project and Northwestern Airfields. Supplies and materials passing through Prince Rupert went by boat and barge through the Inland Passage to Skagway, thence over the narrow gauge White Pass and Yukon Railroad to Whitehorse. From there, in trucks operated by the 477th Quartermaster Regiment, the supplies were hauled both north and south along the Highway, and north up the Canol Road.

The main function of the Prince Rupert Support of Embarkation, at present, is to supply the Aleutians and the Alaskan Theater, as well as the Alaska Highway area in Canada north of Watson Lake and other Pacific areas. Considerably more than a million tons of freight has passed through the port.

Another installation at Prince Rupert is the Staging Area, located at Port Edward about ten miles from the main port. Port Edward's chief purpose is to house and equip personnel moving to and from the North Pacific and Alaskan Theaters.—*From a release by War Department Bureau of Public Relations Press Branch.*

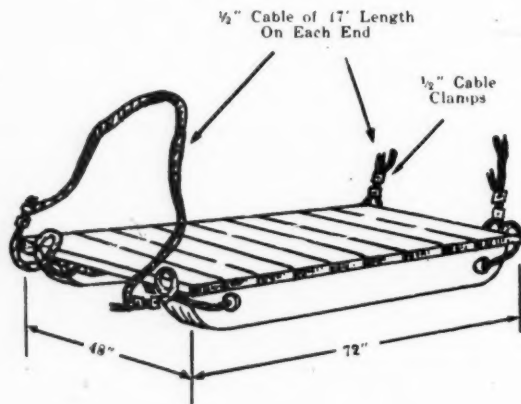
Palletizing

MAJOR WINFRED C. NASELROAD, *Quartermaster Corps*
Instructor, Command and General Staff School

THE advisability of the use of pallets in amphibious operations has been widely discussed since they were first employed. Certain groups advocate the palletizing of all of the supplies which are to be used during an amphibious operation; while another group maintains that the use of pallets in any quantity is a waste of time and material. A third group, which takes the middle road, advances the thought that perhaps some logical thinking should be done before making a decision of whether or not pallets should be employed. This last group is generally of the opinion that the ever-present "Situation" should be the deciding factor, and that there definitely is a place

for pallets in amphibious operations if wisely employed.

Before getting too far along on the subject, let us all arrive at a common definition of just what is meant by the term "pallet" as applied to amphibious operations. A pallet is a platform with runners on the bottom, which may either be open or have a solid-bottom decking. The platform varies in size from 4 feet in width by 6 feet in length to 5 feet in width by 7 feet in length. In some areas, however, a standard-size platform of 4 feet by 6 feet has been used extensively and has proved in field tests to be very satisfactory. The pallet with open runners is usually referred



SKETCH DRAWING OF 4'x6'
SLED PALLET

Figure 1.

to as the "sled" or "runner" type; and the pallet with the solid-bottom decking is generally known as the "toboggan." Both types of pallets were designed for the same purpose: the movement of supplies across the beaches from the landing craft to the dump areas.

The lumber required in the construction of the toboggan pallet is nearly twice the amount used in building the sled. One hundred and forty-one board feet is the amount required to construct the toboggan, and only seventy-two board feet is necessary to build the sled pallet. The additional lumber used in the toboggan increases the weight of it to fifty pounds more than that of the sled, making the toboggan weight two hundred and fifty pounds and the sled only two hundred pounds.

Both pallets are equipped with hauling slings as an integral part of the pallet. The

slings are made of $\frac{1}{2}$ -inch steel cable and are from 14 to 17 feet long, one being secured to the front and one to the back of the pallet.

Visual inspection of Figures 1 and 2 shows that the simplicity of the sled and the difference in the material required for the construction of the two types of pallets make it advantageous to use the sled rather than the toboggan pallet. However, there are situations in which it is advisable to use the toboggan and not the sled, an excellent example being the operation on Kiska. In the Kiska operation it was necessary to move over one hundred thousand tons of supplies and impedimenta across difficult beaches and muskeg to the beach dispersal areas. Fifty-five hundred toboggan pallets were used for this purpose. Loose sand, mud, and muskeg had to be traversed. The toboggan served

SKETCH DRAWING OF 4' x 6' TOBOGGAN PALLET

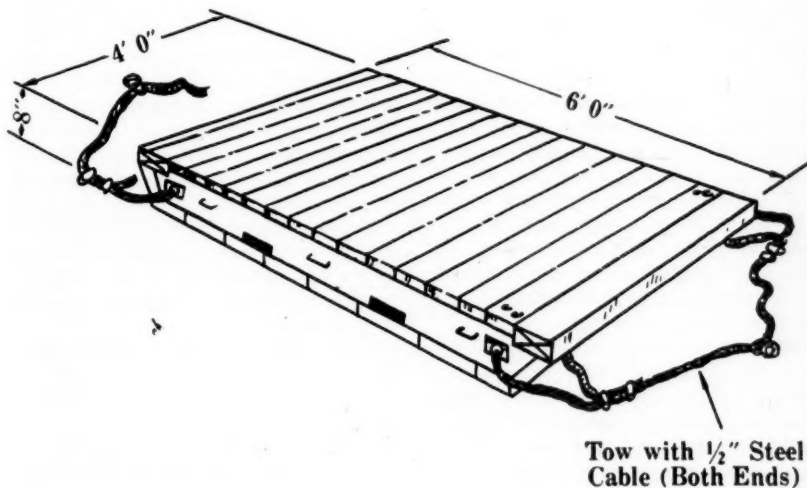


Figure 2.

to smooth out and improve the tractor ways; whereas the sled would have dug in and cut them up.

In contrast to the Kiska operation, the operation on Kwajalein successfully employed 4,174 sled pallets. Contributing to their success was the fact that the beaches of Kwajalein were in much better condition than those encountered on Kiska, and the sled had no trouble negotiating them.

The advantages and disadvantages in the use of pallets in an amphibious operation could be the subject of a long and arduous debate and would probably end with neither contestant gaining a point over the other; and if a decision is to be made, there is hardly time to hold a debate. So, if the person who is to make the decision will ask these questions, and can get an affirmative answer, it is safe to assume that the use of pallets will prove to be an asset to the operation:

1. Is material available in adequate quantities for the construction of the pallets, and are sufficient amounts of the necessary equipment and material available for the loading of the pallets? For the Kwajalein operation more than 300,000 board feet of lumber went into the construction of the 4,000 pallets, plus 78,000 board feet of dunnage* used in blocking the loads on the pallets. Seventy-five thousand pounds of 1½ by .035-inch steel strapping and 42,000 strapping seals were required. Nearly 60,000 feet of ½-inch steel cable and 18,000 cable clamps were used. For waterproofing, thirty-four 500-foot rolls of 60-inch Sisal Kraft paper and sixty gallons of asphalt cement were required. The availability of material will probably be the governing factor in deciding the use of pallets.

2. Is there sufficient time to construct, assemble, and load the pallets? The palletizing for the Kwajalein operation, after the pallets had been constructed, required approximately two months.

* Boards or loose material placed under stored goods to prevent contact with the floor or ground or with a lower layer of goods.

3. Are the beaches such that they can be traversed by tractors towing pallets?

4. Is the approach to the beach area clear? This is very important, because if there are obstacles in the water they will prevent the landing craft from making close-in landings on the beach. In the Guam operation the landing craft used to land one of the infantry divisions could not make close-in landings inasmuch as there was a reef which surrounded the island. This necessitated transferring the personnel and supplies to DUKW's and LVT's at the reef for further transport to the shore. Supplies which were palletized had to be brought to the reef in landing craft, the pallets broken, and the supplies manhandled in the transfer from the landing craft to the DUKW's and LVT's. The pallets could not be used for the purposes for which they were intended.

5. Will there be sufficient equipment available to handle the pallets once they are on the beaches? Two types of equipment are required: cranes for lifting and tractors for towing. It has been recommended that tractors larger than the D-4 be employed, as experience has shown that the D-4 is a little light for the job of towing the pallets and under ideal conditions can seldom tow more than two pallets.

6. Is there adequate shipping space to allow for the loss in the stowage of pallets? It is estimated that approximately thirty per cent of the shipping space is lost in the stowage of pallets.

There is much to be said in favor of pallets and their use; and if they can be employed, pallets will prove definitely advantageous in an amphibious operation. A few of the advantages are:

1. The use of pallets greatly facilitates the unloading of cargo from the ship into the landing craft, since it eliminates rigging in the hold.

2. The unloading of the landing craft is speeded up to more than five times the speed of any type of hand-unloading.

3. Labor required on the beach is reduced by as much as seventy-five per cent. It would for instance require thirty-six men,

each making one trip, to hand-carry the K rations from one pallet.

4. Palletized supplies are better protected against damage by water, rough handling, and pilferage. Palletizing adds rigidity to the regular container and secures small packages into a large, heavy load which individuals cannot carry away.

5. If space is not available for dispersal in the dump area, the pallet loads can be stacked into tiers up to six high, thereby utilizing a small area for the storing of supplies.

6. Pallets that have been unloaded can be re-used for hauling loose cargo.

7. After the supplies have been removed from the pallets they make excellent dunnage for storing supplies, not to mention their use as floors in offices and quarters.

Only after revolving the facts and comparing the advantages with the disadvantages should the decision of whether or not to use pallets be made. If the decision is to utilize pallets, certain fundamentals should be remembered with regard to their use. Adequate handling-equipment must be on the beach before the pallets are brought ashore. The amount of equipment which can be put ashore will determine the amount of palletization that should be done. The pallets should not have to be broken before reaching the dump area. If the pallets have to be broken and the supplies manhandled the purpose of the pallet is defeated. The size of the pallet loads should be standardized. If several different sizes of pallets are used they are difficult to stow. A maximum and minimum weight should be decided upon; 2,000 pounds for minimum and 3,000 pounds for maximum have proved to be satisfactory. A tandem hook should be secured to each pallet, so that they may be readily hooked in tandem. The tandem hook is a simple S hook made of $\frac{3}{4}$ -inch-diameter mild steel.

The decision regarding the use of pallets should be made early in the planning stages of an operation, not only because of the length of time involved in the construction of the pallets, but also because it is vital that the transport quartermaster (TQM) or loading officer know at the earliest possible



Figure 3.—Laudansky pallet loading, 38th Division, Ft. Kam palletizing area. (U.S. Signal Corps photo.)

date how he is going to receive the supplies at the ship's side. Before the TQM can make his loading plan, he will have to know whether the supplies are going to come to him in bulk or on pallets. If only a portion of the supplies are going to be palletized, the TQM will have to be informed as to the number of pallets, what supplies, and how much is to be on each pallet. He will also have to know the dimensions and weight of each type of pallet. Keep in mind that the TQM is a very important man in an amphibious operation. One of his responsibilities is to see that all supplies are stowed in accordance with the priority list determined by the force commander; and if the supplies are to be discharged in the proper sequence, the TQM will have them stowed in inverse order of the priority list.

The responsibility for the construction of the pallets has been in some instances with

the using units. The practice of having the units construct their own pallets has not worked too satisfactorily because there were variations in the type and size of the pallets which hampered the loading and stowing of the pallets.

In the Middle Pacific Area a joint Quartermaster-Engineer project developed a standard pallet, and its use was extensive, and in most cases, successful in that theater. The loading and securing of the supplies on the pallets, however, is the responsibility of the using organization; and some units have gone so far as to develop standard loads

for pallets such as the one shown in Figure 3.

The indiscriminate use of pallets may be detrimental to an operation; while, on the other hand, palletization of a portion of the supplies may be justified and prove to be an asset. However, only in exceptional situations should more than fifty per cent of the supplies be palletized. The decision of whether or not to use pallets should be made only after careful study and analysis, and with the use of good common sense and sound judgment.

Balikpapan and 13th AAF

BALIKPAPAN in Borneo was a sprawling nest of refineries, oil fields, and cracking plants. Known as "Ploesti of the Pacific," it yielded some eleven million barrels of gas and oil to the Japs each year.

Defenses protected the base against attack from both air and sea. Nearly one hundred antiaircraft guns were in action during Allied air raids, Jap fighter planes guarded the oil fields from nearby Sepinggan and Manggar airdromes, Imperial Marines garrisoned the town, and barbed-wire beach defenses and intricate underwater mines ringed the area as protection against land invasion.

The 13th AAF was assigned the mission of knocking out Balikpapan. Raids by this unit started in September 1944 when Liberator (B-24) bombers, based on Noemfoor Island 1,300 miles away, flew in unescorted to bomb the objective. Zeroes and fierce antiaircraft fire accounted for nine bombers, the largest loss in any raid in the Southwest Pacific. Thereafter, fighter escort accompanied the bombers. The results of this strategic bombing were reflected almost immediately in operations to the north, Jap airplanes in the Leyte operation, for instance, being captured in good condition on the runways of Jap airfields but without gasoline with which to fly.

Invasion of Balikpapan came on 1 July 1945 when the Australian Seventh Division stepped off to the attack. At this time the 13th AAF planes stopped their strategic blows against oil industries and gave close tactical support to the ground troops. The thoroughness with which the mission was carried out in the direct support phases of the operation permitted capture of Balikpapan with fewer casualties than had been anticipated.—From a release by Public Relations Officer, 13th Army Air Force.

The Task Organization for Amphibious Operations

LIEUTENANT COLONEL WOOD B. KYLE, *United States Marine Corps*

Instructor, Command and General Staff School

IN the Pacific we won a war that according to a theory prevalent only a few years ago could not be fought at all. It was widely assumed prior to December 1941 that the United States and Japan could not come to military grips. The broad reaches of the world's largest ocean were thought to interpose an insurmountable obstacle to large-scale offensive operations, rendering each country dominant in its own half of the Pacific and secure from effective attack by the other. Those who believed this theory did not realize that the United States was capable of performing a miracle in amphibious operations, as well as a miracle of production; nor did they realize that we had been quietly preparing for this Pacific war for a good many years. If you consider the fact that we were able to strike back with an offensive action of our own, an amphibious operation, just eight months to the day after Pearl Harbor, then it is apparent that we were prepared—at least to a limited extent—for this type of warfare. There was little previous experience and history upon which to base our plans, so the tactics and technique used in that first offensive operation of World War II, the landings on Guadalcanal, changed considerably during the progress of the war. Most of these changes, however, were the result of the development of new equipment.

Some of our most important changes in the theory of the principles of ship-to-shore movement have been in the task organization and in control. The two are mentioned together because they are very closely related. It is logical that the control of any organization is dependent to a great extent upon its organization; therefore it is logical to expect changes in one to affect the other.

The formation of a task organization for amphibious operations presents a number of problems that are not common to purely land operations. For instance, in land warfare it is a common practice to form a division into three combat teams and division troops for

movement or bivouac. This formation will, however, be broken up and the division will integrate for combat under centralized control, if the time and the situation permit. If we accept the premise that centralized control is best for combat—and this seems to be generally accepted—then we must wonder why it was once a practice to decentralize control in landing operations, a practice that persists in some degree to the present day.

To understand this properly, we must review some of the history of amphibious training and landing operations. There were actually many things which motivated this theory of decentralized control and the use of the combat team formations. Probably one of the most important was the principle of dispersing each type of troops, equipment, and weapons on as many ships as possible to prevent losing all of one type of unit if a certain ship was sunk. This principle of dispersion worked quite nicely into the practice of forming combat teams and battalion landing teams, each based on its respective infantry component and including all types of weapons and all types of troops. One other important reason for decentralized control was signal communications; or possibly it would be more proper to say lack of communications. A ship-to-shore movement must be controlled almost entirely by radio; and in the early days of World War II our radios simply were not adequate to control properly an operation of this size. These were good and valid reasons, but the organization and control used in early landings would not stand the test of battle. The landing at Tarawa, on 20 November 1943, revealed most of the weaknesses of the system then in use.

If we examine a typical division task organization used prior to that time, we find that it contained only four major elements: the division headquarters group and the three combat teams. The system used in arriving

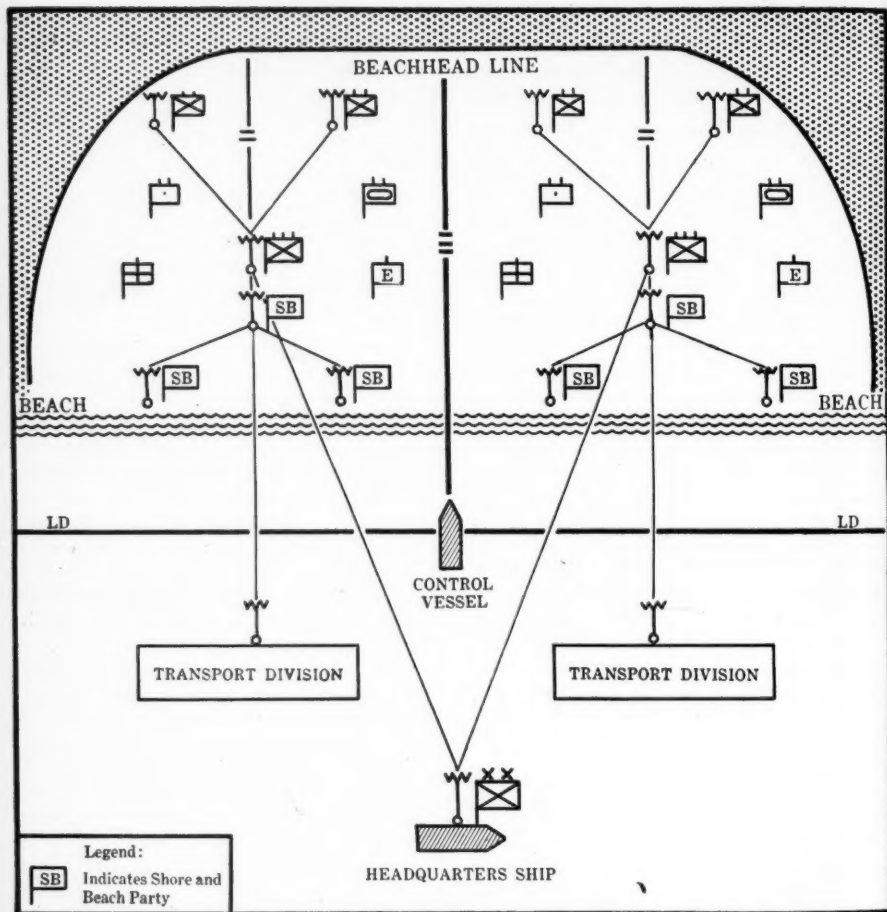


Figure 1.

at this organization was really quite simple. It consisted principally of dividing all elements of the division, both combat and service, into three equal parts to form the combat teams. The division headquarters group was composed of headquarters troops of the division and the headquarters of the various units which were attached to the combat teams.

Battalion landing teams were formed in much the same manner, so that when the organization was completed there were nine battalion landing teams, each one a separate task force within itself.

Figure 1 shows how this force functioned in a landing. Each battalion landing team was transported and supported by an Assault

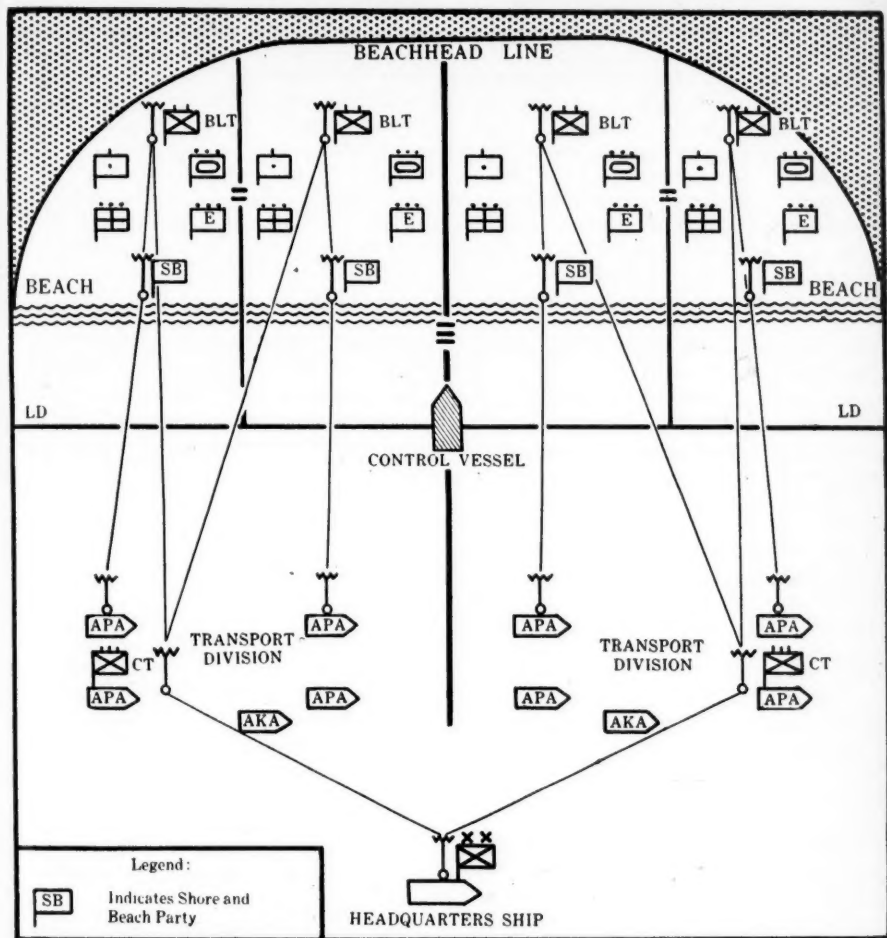


Figure 2.

Transport (APA). Each battalion landing team was responsible for landing all of its own elements, as shown in the figure, and establishing its own source of supply. Supply and evacuation were provided by the shore party and beach party, these two units being the link between the combat troops and their parent transport.

Figure 2 shows the combat-team phase

of the landing. At this time the combat-team headquarters was established ashore and consolidated the shore party and other units under combat-team control. The Transport Division, usually consisting of four transports (APA's) and one cargo ship (AKA), then acted as a unit in support of the combat team. Further consolidation occurred upon the landing of division headquarters. At that

time the beach was consolidated under division control and the transport squadron then acted as a unit.

This system worked in practice maneuvers and when there was little or no opposition on the beach. However, when heavy resistance was encountered on the beach, there was never the opportunity to consolidate the service and supporting elements under combat-team and division control until the front had advanced some distance inland. This meant that just at the time we needed centralized control, the most critical time of the battle, we did not have it. It placed upon the infantry battalion and regimental commanders the burden of supply as well as the burden of combat; the result was that both supply and combat suffered.

Compare the old system of control and supply with the one in use at the end of the war. In Figure 3, note that control and supply are now centralized in one vessel at the line of departure. A battalion landing team is no longer dependent on one transport for supply and evacuation; this function is the responsibility of the logistical-control officer and the medical officer on the transport-squadron control vessel. The battalion landing team does not need to land its own shore party; supply needs can be met by requests to the control vessel, which can send any type of supplies to any beach in amphibious vehicles designated for the purpose. This system of supply from floating dumps can continue as long as necessary; the shore party can be retained aboard ship until there is sufficient beachhead in which to operate.

This system of control allows the division commander to form his organization for combat much the same as he would for land operations. The Division Shore Party can be retained under control of the Shore Party Commander and landed when and where he wishes. Floating supply will accomplish any of the immediate or emergency needs of the units ashore. Actually, the functions performed by the shore party are much the same as before, but now the battalion and regimental commanders are relieved of the

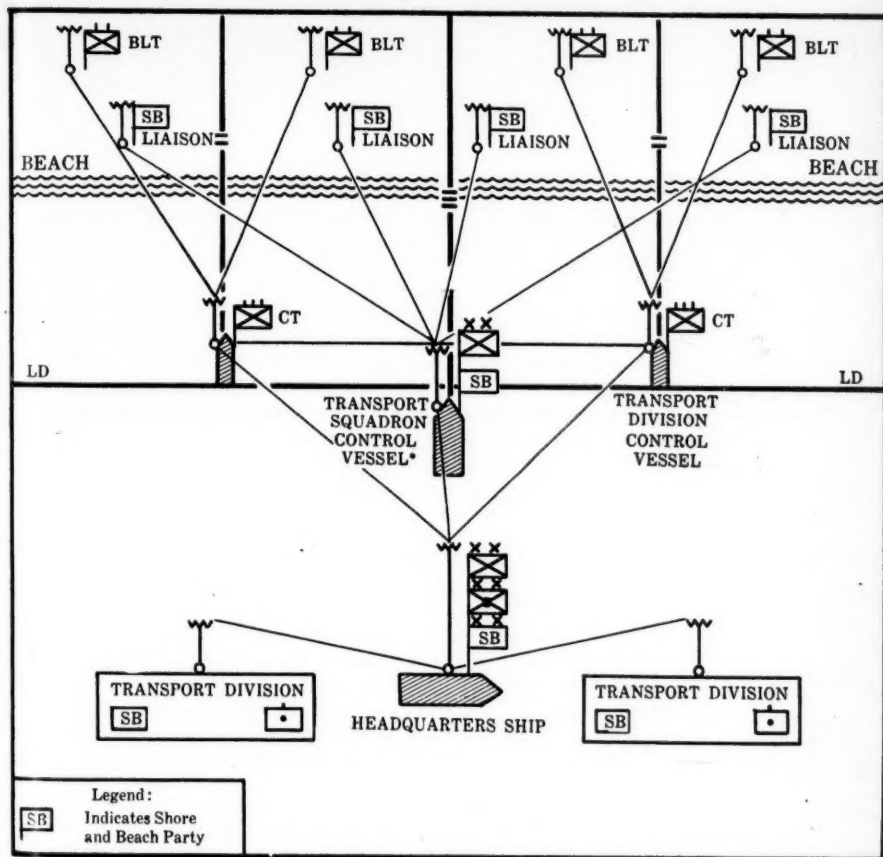
responsibility of landing and controlling this unit. It can now operate in direct support of a unit instead of being attached. This gives the commander the control he needs to influence the action and relieves a lower-unit commander of a burden that he should not bear.

The division artillery can now be landed under direct control of the artillery commander. He can land each battalion as a unit on any beach that he may wish to use. This permits the artillery to centralize control much more rapidly than if it were landed by batteries at the discretion of the various battalion landing team commanders. More important still, it permits the artillery to take advantage of a success on one beach and land where the opposition is light, rather than having certain of its units wait aboard ships or in boats until a stubborn beach is cleared of the enemy. Supply of artillery ammunition—which is always a critical item—can now be centralized either under the artillery S-4 or handled by the logistical officer.

The division task organization that is designed to take advantage of the present ship-to-shore system of control should contain as a minimum the following major elements.

1. Division headquarters and special troops.
2. Shore party.
3. Division artillery.
4. Combat Team One.
5. Combat Team Two.
6. Combat Team Three.

The attachment of various units to these groups will vary with the tactical situation and the terrain. It is necessary and desirable to augment the strength of an infantry regiment for landings. Engineers are frequently needed during the beach assault and will operate, initially, more efficiently if attached. Tanks are almost always needed during the early part of the landing because of the lack of artillery support; they can either be attached before the landing or landed early and attached after they are ashore. The use of chemical-mortar companies, attached as



* *Transport Squadron Control Vessel:* The Senior Naval Control Officer and the Division Control Group are embarked on this vessel. The Division Control Group must contain representatives from both the Operations and Logistics Sections. It may act as a Forward Command Post and contain officers from all of the General Staff sections, representatives of the Division Surgeon, Transport Quartermaster, Shore Party, and Amphibian Tractor Units when they are used.

Figure 3.

part of the combat team for landing, was becoming increasingly popular at the end of the war. Additional medical assistance will be needed by an infantry regiment, almost from the moment of landing. Since the value of medical care depends to a great extent

upon the promptness with which it is given, it is mandatory that elements of the collecting and clearing companies and portable surgical hospitals, if available, be included in the combat teams. It may be necessary to attach some service troops to a combat

team to assist it during the early phases of the operation, but they should be kept to a minimum.

In fact, the attachment of all elements to the infantry should be kept to the minimum. Give them what they need to accomplish the

job, but also leave them free of the burden of supply and fire support. Let the shore party place the supplies ashore within reach of the combat troops, and leave the artillery free to function as it should—under its own commander.

Operation Pluto

The remarkable feat of pipe-lining gasoline under the English channel to supply the Allied armed forces on the continent was one of the war's best kept secrets. United States industry played an important part in the enterprise by secretly and speedily producing a large part of the hollow cable supplied by America—now acclaimed one of the outstanding production achievements of the war. The project is known as Operation Pluto—Pipe Lines Under The Ocean.

U.S. Army engineers, in cooperation with the British Government, first broached the question of manufacturing cable for the under-channel project in April 1944, specifying that long continuous lengths of piping, hitherto not manufactured, were needed. Speed was of paramount importance. Many complex problems were involved, but American industry responded by immediately starting the erection of an entirely new plant in Yonkers. Intricate machinery was designed, built, and erected. Facilities were installed to perform all manufacturing operations simultaneously. Among other things, this involved the application of many separate layers of armoring and protective covering for the cable, which was three inches in diameter on the inside and four and five-eighths inches on the outside.

Armoring and covering machines more than 165 feet long were especially constructed to produce the continuous finished lengths the project demanded. A specially designed superstructure, ninety feet high, was erected to take the finished cable from the armoring machines to one of four large circular platforms, where it was coiled for temporary storage. Later it was carried over the superstructure to docks, where specially converted ships were loaded for transporting overseas.

The extreme weight of the cable when in temporary storage, as well as on shipboard, posed a problem of how to protect the lower layers from being crushed by those above. This was solved by keeping the cables filled with water, under pressure, at all times. Some idea of the problem may be gained from the fact that one coil contained 40 miles of cable and was 50 feet in diameter and 40 feet high. It weighed approximately 4,000 tons, or greater than the tonnage of two destroyers.

On 5 July 1944, only three months after the initial discussion with Army engineers, the first cable was completed. On 16 September 1944, the full quota of sixty-four nautical miles of cable had been achieved. An additional forty-six miles of cable, manufactured by several American companies, in about five-mile lengths, was transported to the Yonkers plant and spliced together into the long shipping lengths required.—*From an American source.*

Mental Hazards to Peace with the Japanese

LIEUTENANT COLONEL ROBERT S. SPENCER, *Air Corps*

IF the Japanese were an enigma during the war, they are proving to be more so now. This is evidenced by the widely differing interpretations placed upon their actions by Americans. Yet it is clear that we must understand the Japanese correctly, if we are not to lose the peace. A growing understanding of their mental processes contributed greatly to winning the war. Again and again they were out-thought, and from the landing at Milne Bay, the Allies began to call the turn in a campaign which saw its finale on the deck of the USS *Missouri* in Tokyo Bay. That much is to the good. But if the Japanese are to be won to a cooperation in a peaceful world, a far deeper grasp of their mental processes is necessary. Out of more than thirty years of close association with this Asiatic people, some basic facts about their psychology, and some of the factors which condition it, are hereby offered as a contribution to that necessary understanding.

The first impression which one receives in dealing with the Japanese is that certain ways of approach are absolutely necessary to obtain their cooperation. This is illustrated by an experience in an interior city of Japan some years since. I was driving down the main street in my car when a bicyclist on my left ("left" is the rule of the road) suddenly decided to cross to the right-hand side, and tried to, without looking back. Fortunately, he hit the side of my car and did no worse than spill himself in the road. Pulling up hurriedly, and running back, I was relieved to see him arising, and with worried scowl, doubtless, I asked, "Why did you do that?" The Japanese drew back in a defensive attitude and demanded, "Is that the way to begin?" and we were at a complete impasse. He would not answer my inquiries as to whether he was hurt, but merely glowered at me in silence. The usual crowd gathered to view this embarrassing situation, and a kindly bystander volunteered to me, "The trouble was on the way you spoke first."

Then turning to the victim he said, "This man merely addressed you as foreigners talk to each other."

Grasping this opportunity so kindly offered, I apologized for the false start and immediately the situation was cleared. The man who had been spilled assured me that the accident was his own fault, that he regretted having taken any of my time, that he could not impose upon me to take him to a doctor, for he was in no way hurt. Frankly, it seemed too good and I was suspicious; but that was the end of an incident which I have pondered long and deeply.

This pondering led me to a conclusion which was later substantiated by a question asked of two of us Americans by a highly educated Japanese university professor: "Why do we Japanese feel inferior in the presence of foreigners?" Behind all of the Japanese insistence upon *junjo*, or the orderly way of doing things, there lies a fear which arises from a sense of insufficiency for life. This demand for *junjo* prevails in the relations of Japanese with each other, especially if they be mutually strangers, but it immediately becomes a predominant factor in the relations of Japanese with non-Japanese. With "inferior" people like the Koreans it comes out in scorn. For the white man who comes under their power it may express itself in the most malevolent cruelty. General Homma, reputedly an Anglophobe, when once he got the British under his thumb at Tientsin, is reported to have gone to the length of having British women partially stripped in the streets—for which there was surely no military justification, but plenty of satisfaction for an inferior ego. Japan, which could have become one of the most powerful nations in the world by a wise utilization of her Manchurian conquests while Germany kept the rest of the world busy, was driven by inner psychological factors to attempt to be supreme, to venture the fatal gamble of world war.

"Why do we Japanese feel inferior in the presence of foreigners?" Doubtless many elements have entered into the complex. Height is one element, as witness the reports that American prisoners over six feet tall suffered more cruel abuse at the hands of their runty guards than the smaller men endured. Isolation from the world through critical centuries doubtless aggravated the situation, and, as they sought vainly to catch up, "face" kept them from simply inquiring the new way. A stilted sense of "honor," developed in the *samurai* world but percolated down to all classes, merely heightened the inner sense of tension.

But two supremely effective elements had place in the development of the inferiority complex which so plagues the Japanese race in its attempt to live in a modern world. One is the tremendous amount of borrowing of alien knowledge and culture, into which the Japanese have been forced by the pressure of history; the other is the system of regimentation which has been used for centuries in Japan.

We of the West are familiar with Japanese borrowing since the reopening of the country by Commodore Perry. Terribly retarded by two and a half centuries of isolation under the Tokugawa Shogunate (an isolation adopted as the result of early clashes with European culture, and itself indicative of the peculiar psychology), Japan went out to "gather knowledge in all the world," as the Meiji Emperor expressed it. Massachusetts furnished the first model of the public school system. France gave Japan her legal system. Prussia supplied the Army setup and certain crucial elements of her political system, especially the controlling contact of the military with the Emperor. England fathered the Japanese Navy. It is true that the Japanese have modified all these acquisitions by their genius for adaptation; but they seem not to be able to forget the borrowing, even when they boast of their adaptations. Thus a certain Japanese admiral delighted to point out to westerners that the Japanese submarine was a better one than the models from which it was copied, because parts had

been made smaller to fit the smaller stature of the Japanese.

It is not so generally known that in Japan of the sixth, seventh, and early eighth centuries the culture of China was being taken in at wholesale. Letters, art, religion, customs—all were copied. The first permanent capital, Nara, was built as a replica of the 7th century capital of China. Its use was begun in 710 AD, and in 712 there appeared the *Kojiki*, Japan's oldest extant history (?). It was written in the very language and characters borrowed from China, but it proclaimed the myth that the Japanese islands, their people, and especially the imperial family were of divine origin; while under the famous words *Hakko Ichi-U*, attributed to the mythical first Emperor, Jimmu Tenno, was subsumed Japan's divine mission to bless the whole world with its imperial way, by force if necessary. One could hardly ask for a finer example of compensation for an inferior ego, overwhelmed by the necessity of a wholesale borrowing of so many of its cultural values from an alien land. Nor is it difficult to understand why the Japanese have never been able to live in true peace with the people of China.

The second major influence in the development of the Japanese inferiority complex is, doubtless, the regimentation which has prevailed for centuries. To go no farther back, under the Tokugawa government, lasting from 1603 to 1868, the life of each individual Japanese was regulated by law in the minutest detail: the color and kind of cloth in the garments of each member of the family; the precise manner of greeting and being greeted; the toys with which one's child might play. All these minute stipulations were enforced by severe laws, and a universal spy system made these laws effective.

That such regimentation persists is illustrated by a personal experience. I was sitting with the faculty of a boys' high school (I was the only westerner present) and we were passing the boys for graduation. One lad's name was called. Good marks! Good conduct! His graduation seemed assured.

But his class-charge teacher broke in with: "We cannot graduate this boy." In response to the inevitable query, he replied, "Because he uses perfume." Fortunately my spontaneous laugh was curbed, else I might never have heard the subsequent discussion, which made plain that not the perfume (which doubtless was atrocious) but the fact that the boy was willing to be different from the other boys was the fatal defect. "He might think for himself," complained the teacher, "and disgrace our school." The boy was not graduated.

That this regimentation proved to be a fatal defect in war, we all know. And this is the place to emphasize the fact that fundamentally we have been going through a struggle between free souls untrained in war and regimented souls schooled highly for battle. Nor should we forget that free souls, coming from filling stations, stores, and banks, have fought better and proved more efficient in war than slave souls.

But this regimentation is also a basic source of the fear which hovers at the back of the Japanese mind, and which he seeks to escape by so ordering the conventions of life that he may never be caught in an unprecedented situation. When he is so caught, the Japanese is to be pitied. The recent surrender, and the negotiations leading up to it, were for Japan a totally unprecedented situation. Many have escaped it by suicide. More will. Many are trying to meet it and yet preserve their outer dignity. Do not expect them to act frankly like a defeated people—psychologically they cannot. But their pathetic attempts to find ways of pleasing the victors by presenting bunches of roses (somebody said that foreigners liked to give and receive flowers!), by erecting booths and serving cold drinks, as

to guests—all of these point to the inner confusion of enslaved souls.

Obviously, to gain the sincere cooperation of such a people, they must be put at their ease. The immediate problem is the treatment of the Japanese with dignity. Here is a great danger for Americans, used to more rough and ready contacts, because we are free souls. One interrogation officer in the U.S. Army insisted that Japanese prisoners, regardless of rank, should be addressed by the low form of the word "you"—*omae*. To those who understand Japanese psychology, the retort of a Japanese prisoner is complete: "The man who says *omae* is himself *omae*." General MacArthur has shown us that severity of handling can be combined with a dignified recognition of the limitations of Japanese psychology which will make that people feel that they are "understood," and which therefore does away with resentment at the severity. With the superior power in our hands, we will be wise to understand the psychological limitations of the island people, even while we crush with severity any attempt to escape the just results of their vicious course.

But the problems which Japan presents will not be solved merely by enforcing a temporary occupation and punishing their war criminals. Already there are signs that recalcitrant Japanese leaders are thinking of a comeback. It will not be enough to crush them; others will arise. We must stay with the job long enough and patiently enough to re-educate the Japanese mind by freeing it from its regimentation, and teaching it the inherent dignity of the human personality. This will not be a short process, but it is the only guarantee of peace—a peace which the Japanese will want to keep.

In reporting to the Imperial Diet after American troops occupied the country, the new Japanese government admitted that out of 62,795 warplanes, Japan lost 51,109—or five of every six planes—and 684 of her 1,217 warships. The Diet was also informed that none of Japan's twelve battleships was seaworthy at the end of the war and only two of her twenty-five carriers were "actually capable of navigation."

—From the Marine Corps Gazette

Staff Organization

COLONEL GLENN H. PALMER, *Signal Corps*
Signal Officer, Fourth Army

The following article discusses certain features of staff organization of interest in connection with the article in October 1945 MILITARY REVIEW by Brigadier General A. W. Pence and Lieutenant Colonel Eugene B. Brownell entitled "Types of Staff Organization Found in the United States Military Forces."—The Author.

AN important feature of both the General Staff and the Director Staff types of organization is the cross relationship which should exist between the functions of the General or Director Staff and those of the Special or Technical Staff. This relationship should be elaborated upon since it is frequently overlooked in organizing staffs, resulting in malfunctioning which is finally corrected only through reorganization or reassignment of duties.

The undesirable effects of a faulty staff organization can be visualized by consideration of Figure 1. In this chart it will be noted that administrative activities pertaining to personnel as individuals are grouped in a Personnel and Administrative Division. Special staff officers representing services which enter directly into combat operations are grouped under a Training Division, while those staff officers representing services which have only supply and maintenance functions in relation to other arms and services are grouped into a Supply and Maintenance Division.

Consider particularly Engineer and Signal activities. The officers most familiar with these services are assigned to the Training Division. These services both have important supply and maintenance functions in their relations with other arms and services, yet no representatives of these services appear in the Supply and Maintenance Division. The head of the Supply and Maintenance Division would presumably be held responsible for supply and maintenance matters as they relate to both Engineer and Signal

equipment, yet the only officers of the staff who may be expected to be technically qualified to supervise these matters are under control of the head of the Training Division.

While it is of course, possible for the Engineer Officer or Signal Officer assigned to the Training Division to function to some extent in supply and maintenance matters, balanced attention to all phases of Engineer or Signal matters would be more likely to result were the Engineer and Signal Officers, respectively, made directly responsible for all Engineer and Signal matters, whether they had to do with personnel, intelligence, operations, or supply and maintenance.

It would also be possible to have Signal and Engineer supply and maintenance functions supervised by separate Signal and Engineer officers assigned to the Supply and Maintenance Division. Coordination of Supply and Maintenance activities with Training activities would then be obtained through cooperation of the Signal Corps or Engineer officers in the different divisions. In general, however, it is believed that better coordination results when responsibility for coordination lies in an echelon next above the activities to be coordinated, rather than in a more remote echelon, such as would be the case here.

In actual operation of a headquarters organized as shown in Figure 1, some difficulty was experienced in obtaining complete coordination of Signal matters, whereas the same personnel under a more normal General and Special Staff organization had functioned very successfully. It is believed that the reason for more efficient functioning under the General and Special Staff type of organization will become evident from the following discussion.

In both the Director Staff and the General Staff types of organization there is a particular section responsible for staff supervision of each of the technical and administrative services (Special Staff Sections) as well as for supervision of each of the common

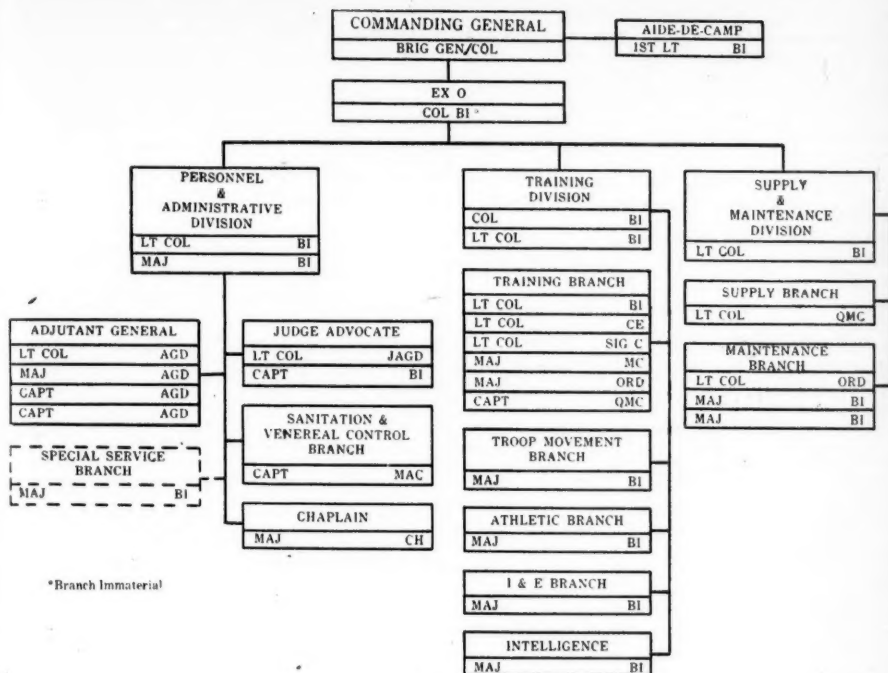


Figure 1.—Organization of a Headquarters.

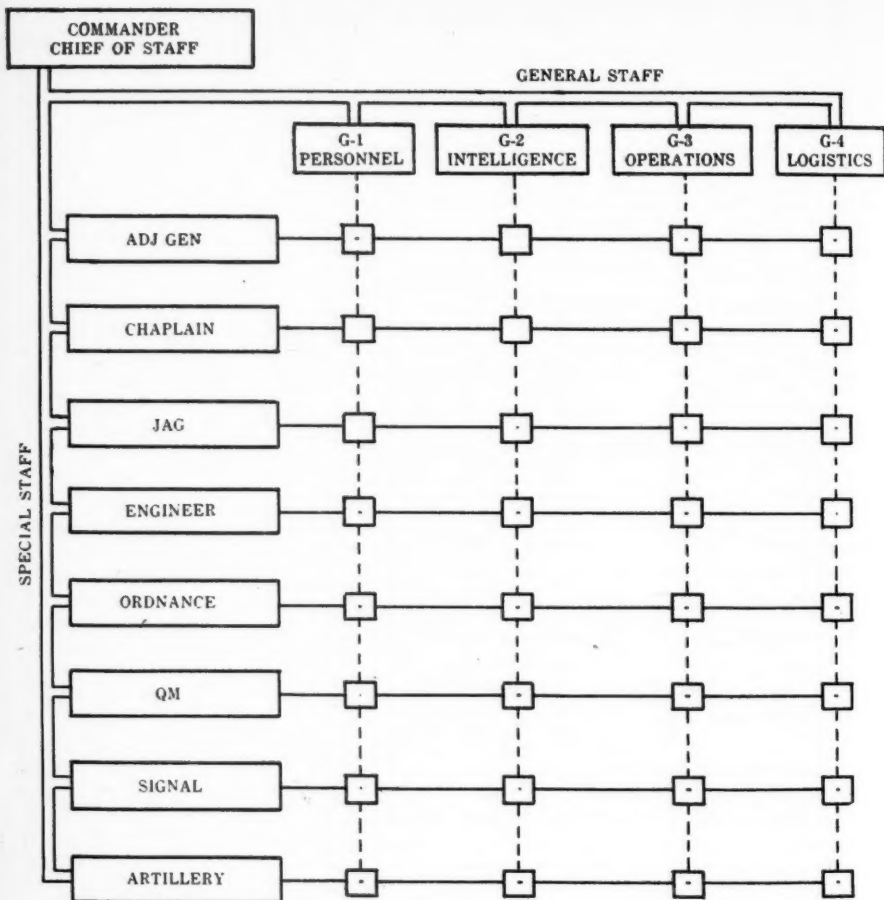
functions; personnel, intelligence, training, and supply (General Staff Sections).

Each Special Staff section is concerned with all functions relating to a particular class of commodities, services, or combat operations. Each General Staff Section is charged with supervising performance of a particular function by all arms and services. In principle each General Staff section deals with all special sections, and each Special Staff section deals with all General Staff sections.

Conflict between policies enunciated by the several General Staff sections is theoretically eliminated through cooperation between the General Staff sections and through the controlling policies prescribed by the Commander or Chief of Staff. In practice, however, the conflict between policies prescribed by

separate General Staff sections may become apparent only when a Special Staff section takes steps to implement those policies in the operation of the particular arm or service which it represents. When such conflict is found it must be brought to the attention of the General Staff sections concerned and the conflict eliminated through agreement between the General Staff sections or through ruling by the commander or Chief of Staff. In such cases the Special Staff section is in a sense bringing about coordination between the several sections of the General Staff; certainly it is coordinating performance of the several general functions within its particular arm or service.

This mutual coordinating relation is represented graphically in Figure 2. It is the



LEGEND:

- ===== COMMAND
- OPERATION OR STAFF SUPERVISION AND PLANNING OF SPECIAL PHASES OF OPERATIONS
- FUNCTIONAL COORDINATION AND STAFF SUPERVISION AND PLANNING OF GENERAL OPERATIONS

Figure 2.—Internal Staff Relations.

cross relationship exemplified by that diagram which should be established in organizing any staff if there is to be complete coordination of matters for which the commander is responsible.

A closely related matter is referred to in the article by the statement: "The four G's do not operate."

One of the most difficult items in the process of making a new staff into an efficient team is to accustom the General Staff personnel to observation of the principle that "the four G's do not operate." Every officer of every General Staff section must continually remind himself that he does not operate, that operation is a function of the Special Staff.

The necessity for this rule arises from the same reasoning as does the requirement for unity of command in an organization. Under this principle there must be one individual responsible for all operations of each combat or service element. Since in larger formations and offices command is exercised largely through a staff, there must be unity of staff direction and supervision of the units of each formation. This requires that in each staff there be a specific section through which all matters affecting a specific arm or service are coordinated. Unless directives for each arm or service are prepared by a single agency, there is always danger of conflicting directives with resultant confusion and inefficient operation. Only if instructions to a particular service are prepared and coordinated by a single agency can the will of the

higher commander be expressed as a *single* will, and unity of command be obtained.

The need for unity of command leads to the practice of operations being directly controlled by Special Staff, while the General Staff sections are held responsible for functional coordination among all arms and services. Without the cross relationship there is always danger that some responsibilities of the commander will be overlooked or inadequately coordinated and performed, or conflicting and duplicating instructions be given. Through this cross relationship between the responsibilities of the several General and Special Staff sections, complete coordination may be obtained.

Under any type of staff organization, coordinated supervision can be obtained only by thorough cooperation between all members of the staff, both General and Special. Each staff officer must realize that he functions not through direct exercise of command, but through assisting the commander by coordinating within the formation all functions which fall within the province of his particular staff section. In general this will require coordination with other staff sections, both General and Special, of those functions which overlap into or lie wholly within the province of the other staff section, whether that other staff section be General or Special. *Cooperation* within the Staff is a prerequisite to complete *coordination* of subordinate activities.

The leader must know what he wants, think rapidly, and tell his subordinates clearly and simply what is desired. The leader should always seek the easy, correct way to perform a task. Very frequently that is not done. The bright subordinate quickly detects the inefficiency of his superior when he does things the hard way.

—Major General Charles H. Corlett, *Commanding General, XXVI Corps.*

Standing Operating Procedure

MAJOR EDGAR M. SLINEY, *Air Corps*

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THE term *Standing Operating Procedure* is one which defines itself to a limited extent. To begin with, we have the old saying, "When in Rome, do as the Romans do." That statement is an SOP. It is a directive prescribing a definite line of action to be followed under a specific situation. A textbook definition of an SOP is: "Routine procedure to be followed in absence of orders to the contrary." In other words, the manner in which we operate at present will remain as it stands until a situation arises requiring a change in our procedure. SOP's can, and must, be modified or changed from time to time in order to maintain their effectiveness.

An example of this occurs especially in new units. In a comparatively new organization their SOP will necessarily have to be quite long and in detail; but as the state of training of the unit progresses, more and more detail can be omitted from the SOP because personnel will have become accustomed to performing certain jobs in a routine manner. Habit patterns will have been formed by frequent practice and the recurrence of situations covered in SOP's.

It must be noted that the material contained in an SOP should be based on the doctrines laid down in field manuals and in directives from higher headquarters, but it should not be a verbatim transcription or rehash of material in these publications. It should contain specific instructions, directing the manner in which the unit will operate as a result of these publications. For example, the normal routine which any officer or enlisted man learns in the course of his training is not set forth in SOP's. Nothing could be gained by including portions of the Infantry Drill Regulations in the SOP of an infantry unit. Regulations serve their purpose as such, but they have no place in an SOP.

It is obvious that it is impractical to establish uniform SOP's for all types of units or all types of operations. What may very well serve one particular unit as an efficient SOP might not be at all applicable to another

similar unit. This inability to establish uniform SOP's is due to the different stages of training within various units, to the different approaches to a situation by various commanders, and to unequal situations presenting themselves to similar units.

When do we use an SOP? Field Manual 100-5 states that in every unit standing operating procedure should be prescribed by the commander whenever practicable. Let us consider an example of a situation that calls for an SOP. The situation is this: A truck convoy is driving along somewhere in a combat area and it is getting dark. The convoy commander begins to wonder about several points such as: At what speed should I now travel? What interval shall I prescribe between trucks? Should I have headlights on bright, dim, blackout, or none at all? Should the spotlight operated by the brake be disconnected? Normally, in any well organized unit the SOP would have covered this type of situation, and the convoy commander would have habitually taken the proper action. There would have been no need for any confusion, as each individual driver would have been familiar with the unit SOP as it pertained to his particular job. Unless the commander had received instructions to the contrary, he would have been guided by the SOP. When to use an SOP will depend entirely on when situations arise for which we have an SOP. Higher headquarters will usually specify the types of situations which lower echelon units will cover in their own SOP's, such as normal everyday operations, combat procedure, procedure in case of air raid, ground attack, and gas alarm. These are only a few of the more obvious situations. Other procedures which apply more to general groups of persons or units are those instructions concerning approach and landing procedures at various airdromes, both in combat areas and in the United States, and bail-out and ditching procedures.

The first purpose of SOP's is to simplify and abbreviate combat orders, to expedite

their transmission, and to permit their being understood easily and certainly; for SOP's, like combat orders, must be simple, concise, and brief. At the same time they must be intelligently applied by all concerned.

A typical example of how an SOP may be used is shown in a ground unit. In an infantry division the composition of combat teams will normally be directed by means of an SOP. Thereafter, in preparing an order for movement and bivouac, the commander may omit the actual composition of the several combat teams, because everyone concerned will realize that the teams are made up normally and contain certain specific units.

There are many other typical examples; but the point is that each commander should, whenever possible, establish SOP's in order to develop a uniform, habitual procedure. By doing so, he automatically permits brevity in orders, and this very brevity, in turn, expedites the transmission of orders and enables their being understood easily and definitely.

The second purpose of SOP's is to simplify and perfect the training of troops. The repetition of correct principles of training under an SOP will serve to simplify, perfect, and standardize the training program of a unit.

For example, when training combat crews, one of the most important phases in their training is ditching procedure. When you establish a definite course of action for each crew member, and hold practice ditching drills often enough to make the procedure routine, you will find that when those crews operate "for pay" in an actual ditching, they will stand a good chance of getting out, because they will be prepared for the emergency and will react according to the habit patterns learned in their perfected training program.

The third purpose of Standing Operating Procedure is to promote understanding and teamwork among the commander, his staff, and the troops. This is achieved by a realization and appreciation on the part of the staff and the troops of the desires of the commander. When he refers to a matter as being SOP they know exactly what he is talking about. They know what he wants and how he wants it done. The commander in turn knows that

his subordinates understand his wishes—so we have perfect team work; as in a good football team, when any particular signal is called, everyone reacts according to Hoyle and all the team commanders know what to expect from each other.

The fourth purpose of Standing Operating Procedure is to facilitate and expedite operations and minimize confusion and error.

An example in this particular case can be shown by an SOP for air and AAA units. Since one of the most difficult problems for AAA is recognition or identification of aircraft, a definite procedure should be set up to eliminate the greater amount of this trouble. So we set up an SOP on approach and landing procedure for friendly aircraft on an air-drome being protected by AAA. Any airplane not following the proper procedure would be considered unidentified and might be fired upon. Naturally, an SOP of this type cannot remain in effect indefinitely. Why? Since its very nature requires frequent changes in order to prevent the enemy from compromising it and employing it to his own advantage. This fourth purpose of SOP's is somewhat of a summary of the previous three. We have learned from them the advantages of adopting SOP's and when we should make use of them.

The next thing we should want to know is when not to use an SOP. The statement "when not to use an SOP" would seem to indicate that there are times when we might muddle through a situation without a definite course of action in mind, but that is not the case. It merely indicates that a commander should change or modify an existing SOP which has become inadequate. Standing Operating Procedure should not hamper the effective tactical employment of troops. Once established, they are not meant to be holy rituals that stand inviolable. If an SOP stands in a commander's way, it is the SOP that suffers. They are adhered to only as long as they enable a unit to operate efficiently. An SOP may work nine times out of ten, but if applied on that tenth occasion it may prove to be a snare and a delusion. A commander

should therefore modify or change his unit SOP as the situation indicates.

An example of an SOP becoming temporarily inadequate may be shown in a ground situation. Let us say that we have a typical combat team containing infantry (one regiment), field artillery (one light battalion), medical troops (one collecting company), and engineers (one platoon). This combat team has a mission requiring independent operations against troops behind strong obstacles. The light artillery battalion which is normally assigned to it is not thought to be strong enough or to have sufficient caliber to reduce the enemy obstacles. We may therefore reinforce this combat team with more or heavier artillery, or both. Let us say we add a battalion of medium artillery. In this particular case, then, we have modified the SOP for the combat team by adding to its normal composition. Previously, this combat team may have operated very successfully, but in this instance its attack might have failed without added support.

Another example would be a situation involving an air defense problem in which an existing SOP becomes permanently outmoded. The situation is this: The enemy's tactics have been to attack our area with night bombings. If we do not have any radar-equipped night fighters, we will have to set up some sort of SOP that will provide the best possible protection without the use of them. So our commander has formulated a defense SOP that involves an outer ring of searchlights to illuminate the enemy planes. Thus our aircraft can attack in this belt by using illumination of the searchlights to locate the enemy. Enemy aircraft that pass through this outer zone into the inner zone are opposed by our antiaircraft artillery. Our own aircraft do not enter this second zone. This SOP serves its purpose at the moment, but the situation changes. We now have a squadron of radar-equipped night fighters.

We no longer need the outer ring of searchlights to illuminate the enemy plane, so our SOP has become obsolete. It must either be revamped or a new one substituted in its place. Unless an SOP is kept up to date at all times, it loses its value and its place in the scheme of operations of the unit.

Now let us consider a good example of what not to put into an SOP. An excerpt from one prepared by a tactical air division in this country for a particular maneuver reads as follows: "*Intelligence*—In order that the Air Force units operate with the greatest possible efficiency in support of ground force units, it is necessary that intelligence information, both from Air units to Ground units and from Ground units to Air units flow with the greatest possible rapidity. Routine periodic reports do not furnish Air units with information of enemy or friendly activity in time to effect the immediate employment of air activities."

All of these words do not, by any stretch of the imagination, constitute an SOP. The statement does not conform to any of the purposes for which an SOP exists. It contains nothing new that can be used as routine operating procedure. It merely contains basic information for an intelligence officer, and so far as an officer who has had even a minimum of training in intelligence is concerned, it simply elaborates a bit on his own knowledge. It does not help him in any way, because it is far too general—and an SOP is meant to be specific. An SOP should be based on doctrine as laid down in field manuals, but it should not merely repeat words or phrases from such manuals. It should set up a definite procedure for the issuing unit and those parts of units coming under the control of the issuing unit. An SOP governs the manner of operation of a unit in the absence of instructions to the contrary. It is a standing order covering a specific situation.

The European Civil Affairs Division

COLONEL H. McE. PENDLETON, *Cavalry*

THE European Civil Affairs Division (ECAD) ceased to exist after nineteen months of operations. As the first full division devoted to civil affairs and military government, it was unique in military and political history.

It had no policy-making function. It was given the original mission of taking 2,400 partially trained public affairs officers and 3,600 untrained but selected enlisted men, organizing them into civil affairs units for Allied territory and military government teams for conquered areas, supplying them, deploying them, training them as teams, and administering to them in the field.

Military government experiences in Africa and Italy indicated some of the things that should not be done, but there was nothing in the books to give direction to a unit deployed from Scotland to Czechoslovakia and from Norway to Switzerland.

Under the command of Colonel [later Brigadier General] Cuthbert P. Stearns, and the direction of Brigadier General Frank J. McSherry, G-5 SHAEF, the division was activated 7 February 1944. The author assumed command on 4 May 1944 while organization was still in progress. It consisted, on paper, of three operating regiments and a reception and training regiment to handle all officers and men arriving from the zone of the interior.

In addition, six special units were organized to handle civil affairs in France, Belgium, Holland, Denmark, Norway, and over-all planning for military government in Germany. The functions of the latter unit were taken over by the United States Group Control Council in October and November 1944.

Each of these special units was administered from the division headquarters. In addition, there was a nomad division headquarters company and service company which combined ordnance and quartermaster functions.

As originally conceived, the regiment would be a central administrative unit for

detachments tailored to fit the communities which would be overrun by our operations. Later, the size of detachments was standardized and the division held specialists in reserve who could be sent to detachments faced with particular problems.

The regimental headquarters handled all such details as rations, morning reports, surveys, and the supply of all necessary items.

Originally the detachments were to be composed, half-and-half, of British and American officers, and American enlisted men. A change in that policy in August-September 1944 required a complete reorganization of the personnel of the division.

The 1st European Civil Affairs Regiment [ECAR], for deployment in France, was composed of practically all personnel conversant with the French language. It was attached to the First Army and by D plus 7 had fourteen detachments in France. Later, companies of the 2d European Civil Affairs Regiment were attached to the 12th Army Group for use of the Third Army. Detachments of both the 1st and 2d Regiments were used extensively in France, Belgium, Luxembourg, and Holland.

The 3d European Civil Affairs Regiment was held in England with four companies of the 2d Regiment attached for the purpose of training for the occupation of Germany, each detachment being "pinpointed" for a specific town or area. Division Headquarters and the 3d ECAR began its movement to the Continent from Manchester, England, on 1 September 1944.

It was about this time that the officers serving with British civil affairs units were returned to ECAD which in turn had to release the British officers serving with its detachments.

The personnel was shuffled so that not only the United States zone would be covered, but that part of the British zone and all of the zone now assigned to the French would have military government supervision.

Special detachments were organized for the supervision of military government in Berlin and Bremen.

It is to be understood that both in civil affairs in liberated countries and military government in occupied areas, American military personnel was not to establish and operate government. Our purpose was only to see that the indigenous government was re-established as soon as combat operations would permit. Then every local resource would be made available for the further prosecution of the war effort.

With millions of displaced persons and slave laborers being liberated, it was necessary to have Allied liaison officers who would act as repatriation officials with some consular authority. ECAD received, processed, schooled, and equipped some 800 officers of ten nationalities for this work. Supplies were on hand to clothe and equip them with either British or American items, depending upon the areas in which they were to serve.

It was obvious that the original table of distribution for the division was inadequate as our armies forged ahead on the north end of the line and plowed through southern Germany. ECAD, on 4 March 1945, at Romilly-sur-Seine, France, opened a School for Military Government. Originally a two-week course was given with a new class entering each Monday. When the school closed on 30 August 1945, it reported that 1,353 officers had completed the courses given.

Officer procurement had posed a problem which was to some degree alleviated when 171 enlisted men were directly commissioned. They were chosen from ECAD and from G-5 staffs throughout the theater.

Both the First and Ninth Armies penetrated and held areas which are now a part of the Russian zone. They had set up provisional military government detachments. Upon relief of the armies and redesignation of the occupation areas, all of these detachments were assigned to ECAD for reorganization and redeployment. At one time the service company had more than 1,000 ve-

hicles in its pool being processed for distribution to these detachments.

The Adjutant General's and G-1 Sections on many days published special orders of more than one hundred paragraphs transferring individuals and detachments as the situation fluctuated.

Much of the personnel of G-5 staffs of the divisions, corps, and armies had at one time been assigned to the division. Upon completion of operations they were returned for assignment to detachments. Upon initial deployment, the division consisted of 1,800 officers and 4,000 enlisted men. There was an officer increase in March of 550. However, by 28 August 1945 the division consisted of 3,157 officers, 139 warrant officers, and 6,234 enlisted men, with 220 officers and 401 enlisted men attached.

As of VE-Day, the European Civil Affairs Division was deployed from Norway to Marseilles, Brest to Czechoslovakia, Bremen to Salzburg in Austria.

There are some features that stand out in the operations of the division indicating that the administrative units were successful.

All members of the division, regardless of where stationed, used the same APO. Detachments passed rapidly from attachment to tactical units as the situation moved eastward. The theater postal section on at least three occasions commented that the mail service was superior to that of an average tactical division.

Each detachment was mobile and had adequate equipment for operations.

The training for pinpoint locations made it possible for detachments to move into strange and sometimes hostile communities knowing the town plan, the utilities, and the local public officials by name, in many instances.

Being attached to combat units, detachments and individual citations and awards read as though the division had been combat rather than administrative in conception.

At least two detachments received the presidential citation. One detachment was captured in the Battle of the Bulge and three

staff officers were captured in a surprise raid by Germans based on the Channel Isles.

Detachments were called upon to deliver babies, improvise civilian hospitals, and provide food, clothing, and shelter to hundreds of thousands. In December 1944 one detachment was transporting ammunition to the 101st Airborne Division in Ardennes.

As the division closed shop, its work went on with the 2d and 3d Military Government Regiments. One was assigned to the Seventh Army operating in the western district, the

other to the Third Army in the eastern district.

Two hundred and ninety-five detachments are now supervising the German public officials in all levels of government, *Land, Regierungsbezirk, Landkreis, and Stadtkreis*.

Perhaps the only full-sized American division to have been activated outside of the United States, the division disbanded after nineteen months of experimentation and success in civil affairs and military government operations.

The Royal Navy's "Fleet Train"

THE idea of a Fleet Train is not new but the principle was extended to give the British Fleet complete mobility and to enable it to operate continuously in distant waters on a scale that had not been attempted since the advent of steam, a design that differed greatly from existing ideas whereby a fleet returned to shore bases at regular intervals for repairs, recreation, and replenishment of stores and ammunition.

The principle has been developed by the U.S. Navy, but, unlike the Americans, who had time to build a series of land bases across the Pacific as they pushed westward, the Royal Navy had from the start to operate between 3,000 and 4,000 miles from its main base at Sydney. The function of the Pacific Fleet Train was to feed, service, and maintain the Battle Fleet, and enable it to operate in areas where distance precluded its returning to base except very occasionally. It was, in effect, a floating industrial seaport, under its own steam, with factories, repair shops, floating docks, cranes, stores, barracks, hangars, refrigerators, fuel depots, waterworks, ferries, breweries, hospitals, administrative offices, and social and amusement centers.

The complete Pacific Fleet Train comprised well over one hundred vessels of thirty specialized types sailing under the White, Red, and Blue ensigns. A number of these ships were built in Canada, as it was found to be more economical to adapt new merchant ships while they were building for the exact purposes they would have to fulfill; in other cases, existing merchant ships were adapted. The services provided by the Pacific Fleet Train in forward operational areas included food, water, ammunition, transportation of drafts amounting to 1,000 men a month, stores, spare parts, repairs, maintenance, refueling, accommodation, administration, amenities, salvage and working parties; in addition, there were the minor services supplied by 400-odd harbor craft, tugs, lighters, etc.

The great task of feeding and supplying the Pacific Fleet at so great a distance from its main base developed on issuing ships. These were usually 8,000 to 10,000-ton Victory ships. They were not bulk loaded as freight ships, but like floating department stores, their goods were stowed in racks and bins, so that every item was available for immediate issue in small or large quantity. Victualing Supply Issuing Ships were designed to carry 30,000 men-months of meat, vegetables, and non-refrigerated stores, including clothing and mess gear to meet the needs of 10,000 men for one month. The Pacific Fleet and its train could empty one of these in about ten days.—*From the Sphere (Great Britain)* 8 September 1945.

United States Employment of Underground Forces

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MANY stories have been told recently of the exploits of the underground or guerrilla forces operating within the Axis-held countries during this war. Some of these stories have been true, but many have been pure fiction. The real story of the military value of these forces lies somewhere between the few facts that have been told and the many romantic actions with which they have been incorrectly credited. In spite of the fiction written on the subject, there is no question that these forces have been of great assistance in our military operations: through force of arms, as sources of intelligence, and through hindering the enemy by acts of sabotage. It may be of interest to us to analyze these forces; to see how they came into existence; what motivated them; and how they came to be effective fighting forces, coordinated to supplement our orthodox military power.

When France and the Low Countries were overrun by the Germans, small groups of patriots banded together in an attempt to do anything possible to hamper the activities of the enemy and to further the interests of their own countries. At first these were only small isolated groups of people, well known to one another. Such a group might consist only of the country doctor or the village curé and a few trusted friends. They were motivated by a common hatred of the enemy and a love for their country and their way of life. Small and unorganized as they were, much valuable information was smuggled out to the allied forces from these groups even before their operations and organization justified calling them a "resistance movement." These, for the most part, unorganized groups picked up Allied fliers who were shot down over the French and Dutch countryside, cared for them, and helped them to evade capture. Gradually these groups came to know similar groups of men and women in near-by villages. Some semblance of organization or concerted effort began to be apparent; and

the movement had started on its long road toward what later developed into a powerful force.

In other parts of Europe, the Balkans for example, certain societies or organizations were already in existence prior to the occupation of their country by Axis forces. In Yugoslavia, the Chetniks, an organization far predating this war, were quickly able to organize resistance to the enemy—resistance typified not only by sabotage but by strong military action.

In the Philippines there was hatred of the Japanese. There was a strong desire to continue the fight and to hamper the enemy in every possible way.

Long before our entry into the war, the Chinese fought the Jap from behind the Jap lines. The farmer working his rice fields by day became a saboteur by night.

In Korea, thousands of Koreans hated the Japanese with a hatred that had grown, rather than diminished, during the years of Japanese occupation and control.

It must be understood that while these groups were unified to an extent by their common desire to throw off the yoke of the conqueror, their efforts were diffused by the individual, personal ambitions of each group. For example, in most countries there had been for some time prior to the start of the war, underground movements actuated by the varied social and political ideologies. These differences caused cleavages in the united effort of the underground movements. Thus it developed that actions originally designed by one group to be detrimental to the occupying forces actually worked in some instances to the detriment of some other group within the resistance movement. Because this was war, and these cleavages within the resistance movements in all countries worked against the best interests of the Allies, it became necessary to integrate resistance movements within the scope of future Allied operations.

In the areas mentioned, the desire to injure the enemy existed without effort on our part. These people were motivated by their love of country, hatred of the enemy, desire for freedom of action, desire for revenge, rebellion against cruelty and injustice, and even their political and social ideologies. If the forces so motivated could be used to hamper and hinder the enemy, their efforts could be utilized to our advantage.

In other areas, where no resistance groups existed, motivation could possibly be supplied by us, or fostered by us, that would create a force of resistance that would hamper the enemy, and so serve our ends just as well as though the motivation had been natural.

If by radio, by leaflets dropped from planes, or by any other means of propaganda, we could sow the seed of hope and stimulate the will to resist; if we could supply the matériel of war, the leadership, and the necessary organization—then we would have an army within the enemy lines. In varying degrees in various sections of the world, this is precisely what was done. We supplied money, arms, matériel. We built up hope for the future, increased morale, and in many instances supplied leaders who, in addition to having mastery of the technique of sabotage and guerrilla warfare, spoke fluently the language of the country concerned and were thoroughly steeped in the political and social background of the people with whom they were to work. From isolated, unorganized groups of patriots, sometimes unarmed and unled, there grew to be a truly military force—a guerrilla force—in the countries held by our enemies.

In no two theaters of operations were the results quite the same. No two peoples, no two nationalities, were organized along exactly parallel lines. In no two theaters were the benefits we received from this work quite the same. Mikhailovich's Chetniks, and later Tito's Partisans, were far different from the Chinese Guerrillas, the F.F.I. [French Forces of the Interior], or the Italian Partisans. Each organization fought

the enemy in a different way, a way dictated by the relative size of the opposing forces, the terrain, the available weapons, and by dozens of other factors. Generally speaking, however, underground forces were able to commit acts of sabotage, to assist in the evasion and escape of our military personnel from enemy or occupied countries, and to require the enemy to employ large numbers of troops in police and guard duties, thus reducing the number of troops available for employment against us on the active fronts. It is also obvious that underground forces were a tremendous potential source of information regarding the enemy. Such information could be of great value to us, if we knew its source and could properly evaluate its accuracy.

There is obviously a close relationship between the type of intelligence collected by our own espionage and intelligence that might be gained from the various resistance organizations. There are, however, a few differences. For example, there were no organized resistance groups within the Axis countries proper with whom it was possible to work. As a result, it was necessary to depend wholly on agents for clandestine intelligence from the enemy homeland. Within the countries where resistance movements were well organized, however, each member was at least a potential observer; and consequently the intelligence coverage was widespread and extremely detailed in scope. But before this great pool of information could be tapped by us, it was necessary to establish close contact between Allied Headquarters and the underground organization; to set up a fast, workable system of communications; and to see that our headquarters was thoroughly familiar with the organizations with which we were dealing, with their limitations, their scope, and their zone of operations. It must not be forgotten that these guerrilla forces were not primarily intelligence-collecting agencies. They were supplied with arms, money, and as mentioned, sometimes with leaders; because they were, first of all, irregular troops whose primary

purpose was to hinder and combat the enemy by direct action, whether that direct action took the form of sabotage or force of arms.

Many problems had to be solved in order to utilize, to the fullest extent, the great possibilities of these underground or guerrilla forces. Trained military personnel had to be supplied. Men who were able, by virtue of special training, were needed; to help weld small resistance groups into a unified force; to direct the force so created along the lines prescribed by the theater commander; to provide liaison between the theater headquarters and the heads of the underground movements; and to provide a system of communications by which intelligence could be rapidly transmitted. It was necessary to train officers to represent these guerrilla forces on the theater staff. These officers were to be able to arrange for supply of money and matériel to the guerrillas.

The training of personnel for work with the various underground forces presented many difficult problems. A highly-specialized training program was required to encompass the political, social, military, and linguistic requirements for this type of duty. Unless the personnel selected for duty with the underground were of the highest type and thoroughly versed in the language, background, and philosophy of the people with whom they were to work, they could easily be worse than useless in effecting the much needed understanding and liaison with our own forces. This difficult task was finally assigned to the Office of Strategic Services, the only organization sufficiently flexible and well equipped to accomplish the mission. That this mission was successfully accomplished has been proved in the field in almost every theater of operation.

The contribution of the Office of Strategic Services in connection with the utilization of underground forces did not end with the training of personnel. After the training had been finished and personnel had been physically placed with the underground groups with whom they were to work, there was needed some organization that would be

charged with their maintenance, their supply of matériel, and with the transmission of orders from the theater commander to those officers working within enemy or enemy-occupied territory. These duties were carried out at theater level through the Strategic Services Officer (SSO) on the theater staff. The SSO usually worked as a subsection of G-2 or G-3; and he was given an extensive specialized training in preparation for his duties. He knew the conditions under which the underground forces with whom he was dealing were operating; and he knew the personalities, the limitations, and the characteristics of our officers who were with them in the field. The SSO was the connecting link between the regular military forces of the theater and the underground forces operating in the theater. The SSO arranged for communication with our own officers on duty with the underground, who were known as Special Operations Officers. As a result of the close system of liaison they were able to arrange air drops of vitally needed arms, ammunition, and matériel.

While this cooperation with underground forces was successfully carried out in almost every theater of operation, there was no great similarity in the way the underground was utilized; for the relative strength of the underground in each theater had to be taken into consideration, as well as the terrain and the type of action contemplated. For instance, there was a great difference between the help received from the F. F. I. and that afforded by the Kachins in Burma.

Long before D-day the F. F. I. were well organized. Direct communication had been established for months between them and our theater headquarters. They had been supplied with money, with the matériel of war, with the implements of sabotage, and with what is equally important: a plan of action to be carried out when the signal was given, just prior to the invasion by Allied troops. As we know, when that signal was given, bridges blew up, trains were derailed, light and power failed, roads and tunnels were blocked. The movement of enemy troops and supplies was

slowed almost to a standstill. It was a wonderful job of organization and a wonderful job of fighting.

It was also a wonderful source of intelligence; for, owing to our contact of long standing with these forces, proper evaluation could be made of the reports and information constantly flowing from the underground in France to our headquarters in England.

As our armies sped across France and across the Low Countries, our established agents, carefully placed to provide us with intelligence, were overrun. Long before it was believed possible, our front lines had moved ahead, past the area where these agents were operating; and we were forced to depend, to a far larger extent than was originally anticipated, on intelligence from the F. F. I. and the other organized underground forces.

In Burma quite a different situation existed. Some of the Burmese were actively collaborating with the Japanese, a few were still sympathetic to the Allied cause; but there were no organized, naturally-motivated resistance groups in existence. There were, however, in the jungles of Burma a tribe called the Kachins. These people were a fierce, unschooled but intelligent tribe. Through early contact with American missionaries a certain feeling of sympathy for Americans existed. We should have no illusions about this sympathy. Few tribesmen knew or cared about the existence of a country called America. Their sympathy, if it can be so termed, was inspired by those very few missionaries with whom they had had contact. But another factor operated in our favor. The traditional enemies of the Kachins were the Shans, who had received the Japanese with open arms. The mere fact that the Shans were sympathetic with the Japanese invaders made the Jap an object of hatred by the Kachins, always a warlike tribe.

Early in 1942 it was decided to exploit this feeling. Young officers were selected and subjected to a strenuous and thorough training both in this country and in India. By autumn of 1942 they were air-dropped into

the area of the Burmese jungle where they were to operate with the local tribesmen. These officers were singularly successful in recruiting, organizing, and training the Kachins, and in developing them into an effective fighting force. Key Kachins were taken out of Burma and put through extensive training at a base in India. These trained tribesmen formed a cadre about which a force of Burmese irregulars was formed. The latter were the troops who so successfully carried out Operation Galahad, spearheading Merrill's Marauders and many others, fighting always behind the Japanese lines, destroying communications and supply dumps, and harassing the enemy rear. The intelligence received from this irregular force made possible many of our most successful air operations of this campaign. Installations, supply dumps, and troop concentrations, invisible from the air through the dense jungle foliage, were accurately spotted and their locations forwarded to our headquarters. The success of the whole operation in Burma was definitely affected by the intelligence received through these guerrilla forces.

It must be considered that secret intelligence is produced by people who are trained observers. Inasmuch as intelligence is their business, their reason for existence, they may be considered as professionals. The vast majority of underground or guerrilla personnel, on the other hand, are not trained observers. Their knowledge of troops, of quantities of supplies, and of matériel of war is often insufficient to permit accurate reporting. For example, a secret intelligence agent who has had ordnance training might, and probably would, be able to report a new type of, say, 120-mm gun or the fire control instruments that go with it. The average Italian partisan, unless he had had considerable and recent artillery training might, upon inspection of the same gun, report that it was a 120-mm gun, or perhaps that it was simply a large gun, bigger than the ones that he was somewhat familiar with. On the other extreme, a Kachin tribesman, who has never seen anything larger than a machine gun,

might report, on looking at the same piece of equipment, that the enemy had the "biggest gun in the world!"

Consequently, intelligence reports from underground and guerrilla forces must be evaluated in the light of the experience of the person who is observing and reporting. Otherwise, such reports might well be so misleading as to be valueless. The American Special Operations Officer attached to a guerrilla group is perhaps best able to evaluate information coming from the organization with which he is working, and his judgment usually must be relied upon.

If there is a front line, then the intelligence from underground forces is apt to be tactical rather than strategic in nature; whereas secret intelligence is more apt to be strategic than tactical. A good example of tactical intelligence by underground forces operating a comparatively short distance behind enemy lines is the reporting of immobilized enemy troops or supply trains. One of the most successful types of guerrilla action was the blowing of bridges in front of and behind an enemy military train, and then informing our air forces of the exact location of the train. In other words, a fleeting target was pinned down and immobilized preparatory to an air strike.

During the fight for France and the Low Countries, the French, Dutch, and Belgian underground forces were invaluable in reporting the locations, strength, and disposi-

tions of by-passed portions of enemy troops and in weeding collaborationists and other nationals left behind during a retreat to act as agents or saboteurs. Prior to the invasion, disposition of the German troops and main supply routes was accurately reported by these underground forces. Extremely valuable intelligence was produced by the quick action of the underground forces in capturing enemy documents and records behind the enemy lines and just ahead of our advance.

In every theater of operations, the examples of essential intelligence supplied to us by underground forces are endless in number.

The full record of the part that resistance forces, underground or guerrilla troops, played in the war has not yet been compiled. The extent of their sabotage and direct action has not yet been fully evaluated. But, when the history of this war is finally written, the part played by these organizations in bringing about the final defeat of the Axis powers may well exceed our present estimate.

The underground forces of many lands aided us tremendously by extensive sabotage and fierce and stubborn fighting. Even so, it is quite probable that the essential intelligence that we received from these same sources had an even more decisive influence on the final outcome of the war.

The *velocity* of war has reached such a stage that delay is fatal. Air power and amphibious operations vitally changed the pattern of the conduct of this last war. Atomic developments and supersonic speeds open a vista of immediate changes much more radical, in which the velocity of war is increased to unimaginable rates. Warnings of impending wars are no longer the custom of aggressive nations.

—Lieutenant General Raymond S. McLain

The Corregidor Operation

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This article was prepared from various reports and accounts of the operation by participating and interested personnel. Much of the material used was derived from a report entitled "Corregidor" by Colonel Carl Danberg, Air Corps; a narrative report of the 317th Troop Carrier Group; and a report by Lieutenant Colonel T. R. Clinkscales, Air Corps, for the Air Evaluation Board, Southwest Pacific Area.—THE EDITOR.

Estimate of the Situation

A formal estimate of the air situation and enemy capabilities was not published by Fifth Air Force or any of its subordinate units, but an almost continuous informal estimate was presented through the medium of daily conferences held during the planning period. These conferences were attended by Fifth Air Force staff officers and the commanders and intelligence officers of the Parachute Regimental Combat Team [PRCT] and the Troop Carrier Group.

According to Fifth Air Force, the possibility of enemy air reaction to the Corregidor operation was so remote as to cause no concern. The enemy had no operational airfields close enough to constitute much of a threat, and he had only a few, if any, operational aircraft in the Philippines with which he might contest the operation. However, plans included continuous air cover by fighter aircraft, and fighters to escort the troop carrier planes in the event that there was any opposition by enemy air.

The only anticipated opposition to the aerial attacks was mobile machine guns and small arms. The enemy's AAA defenses had been pounded several times daily over a period of twenty-three days and were believed to have been destroyed or rendered unserviceable. Plans included concentrated strafing and naval and aerial bombardment, prior to and during the paratroop landing, which was to neutralize machine gun and

small arms fire and also silence any possible fire from AAA defenses. The estimates and the plans on which the operation was based proved accurate in every respect, except that slight AAA fire was encountered by troop carrier and strike aircraft during the two-day assault.

Estimates of the ground situation were published by Sixth Army, XI Corps, and the PRCT in their respective field orders. The Navy's estimate of the over-all situation was published as an annex to the operation plan of the Commander of the Amphibious Group.

Coordination

Aside from the sentimental aspects of the retaking of "The Rock," the entire operation represents a notable coordinated effort of air, ground, and naval forces against a common objective. The speed with which the fall of Corregidor Island was consummated is a tribute to the effectiveness of the coordinated planning and the execution of these plans, particularly when consideration is given to the size of the enemy garrison and the strong defensive positions manned.

The Commanding General, XI Corps was directed by Sixth Army: to arrange the details of air operations direct with the Commanding General, Fifth Air Force; to arrange details of loading, and naval gunfire support with the designated commander of naval supporting forces; and to coordinate the employment of the 503d PRCT with the Commanding General, Eighth Army, and the Commanding General, Fifth Air Force.

To accomplish the coordination necessary for this operation there were conferences held at Sixth Army Headquarters on 6 February, 1945, at XI Corps Headquarters on 7 February, and on the flagship of the Commander, Amphibious Group Nine on 8 February. The conference aboard the flagship was attended by: the Commanding General, XI Corps; the Commanding General, 54th Troop Carrier Wing; the Commander, Seventh Amphibious Forces; the Commander, Cruisers Seventh



Figure 1.—Island of Corregidor as it appeared after the “softening up” attacks had been made. (U.S. Signal Corps photo.)

Fleet; the Commander, Amphibious Group Nine; G-3, XI Corps; A-3, Fifth Air Force; the Commanding Officer, “Rock Force”; the Airborne Liaison Officer, Sixth Army; and various staff officers assigned to the headquarters and commands named. Further coordination of naval and Far East Air Forces operations was accomplished by conferences between Fifth Air Force and the Air Liaison Officer of TG 78.3 at Mindoro. Details of the paratroop phase of the operation were worked out at conferences attended by the Command-

ing Officers, 503d PRCT and 317th Troop Carrier Group and their staffs.

It is important to note the number of personal contacts and conferences that occurred in working out the details of this operation, since the results and the execution of the operation are exemplified by the efficiency, effectiveness, and dispatch with which the operation was conducted. There can be no doubt that plans were made to the last detail, and that all units were well aware of their own responsibilities, as well as those of all other participating forces.



Figure 2.—Landing boats approaching island of Corregidor. Eleven boats appear as white streamers. (U.S. Signal Corps photo.)

Execution

The execution of the Corregidor operation actually began on 23 January 1945, when twenty Thirteenth Air Force B-24's dropped 180 250-pound GP [general purpose] bombs on the island and sixteen Fifth Air Force A-20's bombed and strafed the island. From 23 January on, the tempo of the bombing and strafing increased steadily, day by day, up to the date of the amphibious and paratroop landings on 16 February 1945.

During the three weeks spent in the softening of Corregidor, the Fifth Air Force conducted a total of 696 sorties, and the Thirteenth Air Force ran a total of 316 B-24 sorties alone. Together, the two air forces

dropped 3,128 tons of bombs on the island before 16 February. In order to appreciate the extent of the bombing effort, the small size of the island must be considered. From the westernmost point of Corregidor Island to Hooker Point on the eastern tip is a distance of only 7,000 yards. Also, the approximately circular section of land forming the western half of the island and comprising most of the land area is only 2,300 yards in diameter. Thus, while the number of sorties or bomb tonnage may appear small when compared to European air operations, the bomb concentration on such a small area is significant.

The effects of the bombing of anti-aircraft and seacoast gun positions and other installa-

tions are evident. At the time of the first air missions against Corregidor, antiaircraft fire was reported by combat crews to be intense, and photo interpretation listed the aircraft defenses as seven heavy, eighteen medium, and ten light positions. Of course this did not include those guns kept concealed in caves until needed, at which time they were moved out. Within a short time, antiaircraft resistance had dwindled away to the point where our aircraft attacked the target with impunity.

On 13 February elements of a U.S. Navy task force, comprised of five cruisers, six destroyers, PT [motor torpedo] boats, and other vessels, began shelling installations in Mariveles Harbor on Bataan Peninsula, Caballo Island, and Corregidor Island. This work was directed against pillboxes, waterline caves, tunnels, and gun installations on Corregidor. The shelling of Corregidor continued through the landings made at Mariveles on 15 February and Corregidor on 16 February.

The assault of Corregidor on 16 February was a masterpiece of timing and coordination and reflected the value of the personal discussions held during the planning phase. No team, athletic or military, has ever displayed more precision than was displayed by this great air-ground-navy team. Even the weather was favorable for the drama that was begun a little before 0800L. The sky was almost clear. In the early morning there was a broken, thin layer of stratus at 6,000 feet over Corregidor, but this dissolved later and subsequent reports were: CAVU [ceiling and visibility unlimited].

The heavies started off the day's activities with twenty-four Fifth Air Force B-24's hitting gun positions with 960 260-pound fragmentation bombs between 0747I and 0759I with good results. One minute after the heavies left the target area, eleven B-25's bombed and strafed, dispersing eighty 100-pound bombs throughout the southern half of the western part of the island and expending 1,592 rounds of .50 caliber ammunition in strafing passes. Simultaneously with B-25 attacks, twenty-five A-20's bombed

and strafed the western section of the island where the paratroops were to be dropped; while six more A-20's bombed and strafed near-by Caballo Island. These aircraft cleared the target at 0829I; and like a well-oiled machine, cog after cog clicked into place as the first Mindoro-based C-47, bearing paratroops, arrived over the dropping zone at 0830I. At 0833I, thirty-four A-20's arrived on the scene and bombed and strafed the eastern half of Corregidor, dropping 143 250-pound parademo bombs and expending 5,900 rounds of .50 caliber ammunition. As the C-47's continued flying over the dropping zones in trail, thirty-six more A-20's continued to bomb and strafe the eastern half of the island.

The most difficult part of the operation was the accurate placing of the paratroops in the drop zones. The paratroops said they could make a landing there and they did, accomplishing the drops in two zones which were the smallest ever used in the history of paratroop operations. The largest drop zone was only 1,500 feet long by 450 feet, or less, wide; and the other was the same length, but tapered down in some places to only 200-250 feet wide. Not only were the drop zones small, but they were completely ringed with hazards and were studded with bomb craters. On the approach ends of the drop zones there was a precipitous cliff that dropped off abruptly to Manila Bay. All along this cliff and at the water's edge the Japs had concealed machine guns in caves and between boulders. On the remaining sides, there were bomb-shattered framework and rubble of buildings that also contained caves with Japs and machine guns.

A stiff northerly wind which was blowing across the island made the drop even more difficult. Since it took the airplane only ten seconds to cross the entire drop zone, it was impossible to drop more than a stick of eight parachutists on one pass; and the drop zones were so narrow that the drop could be made in no other way than from aircraft in a trail formation. A control airplane was in the area and in com-



Figure 3.—Parachutes landing on Corregidor. (U.S. Signal Corps photo.)

munication with the pilots of the C-47's, in order to supervise and observe the jump. It was originally intended to drop the first stick of parachutists three seconds past the "go-point," but the stiff wind blew them short of the drop zone. The time was increased from three to six, and then to ten, seconds after passing the "go-point," which meant that the first paratrooper of each was jumping over the far end of the drop zone, and the rest were dropping beyond it, with the wind drifting them back into the zone.

On the first mission, fifty-one C-47's were over the target from 0830I to 0932I, making

174 plane-passes over the drop zones to drop 1,021 paratroops and 151 parabundles.

On the second mission, fifty-one C-47's were over the target from 1230I to 1400I. On 170 plane-passes over the drop zones, they dropped 979 paratroops and 159 parabundles.

By the 17th of February the tactical situation was such that it was not deemed necessary to take the risk of jump casualties and the balance of the paratroops were flown to San Marcelino, whence they were transported to Corregidor as another amphibious force.

Between the first and second missions of paratroops on 16 February, the 3d Battalion, 34th Regimental Combat Team made an amphibious landing on Corregidor. Just prior to this amphibious landing the naval task force began intensive shelling of the beaches and installations on Corregidor. The landing beach, both flanks of the beach, and of the shoreline and cliffs, as well as the high ground to the east of the beach, were all shelled vigorously. After the landing by the 3d Battalion, the destroyers of the naval task force fired on call at selected targets, with counterbattery work taking precedence. During the landing and on subsequent days, naval guns fired 2,000 rounds of 3-inch, 2,500 rounds of 5-inch, and 1,500 rounds of 6-inch ammunition at targets on the island. In addi-

tion, the rocket-support ships fired 1,200 rockets in support of the landing. In spite of this preparation, boats approaching the beach were fired on from both flanks and as soon as troops landed they were pinned down. However, by 1800I, 16 February they had established contact with the paratroops dropped "topside," and everything was proceeding ahead of schedule.

There was a Support Aircraft Party Officer of the Fifth Air Force who made the jump with the paratroops. Reports have it that his chute failed to open, but that he survived, even though injured. His radio was assembled atop the hastily-constructed dispensary, from which he transmitted requests for air strikes to assist the paratroops. His requests were answered by A-20's

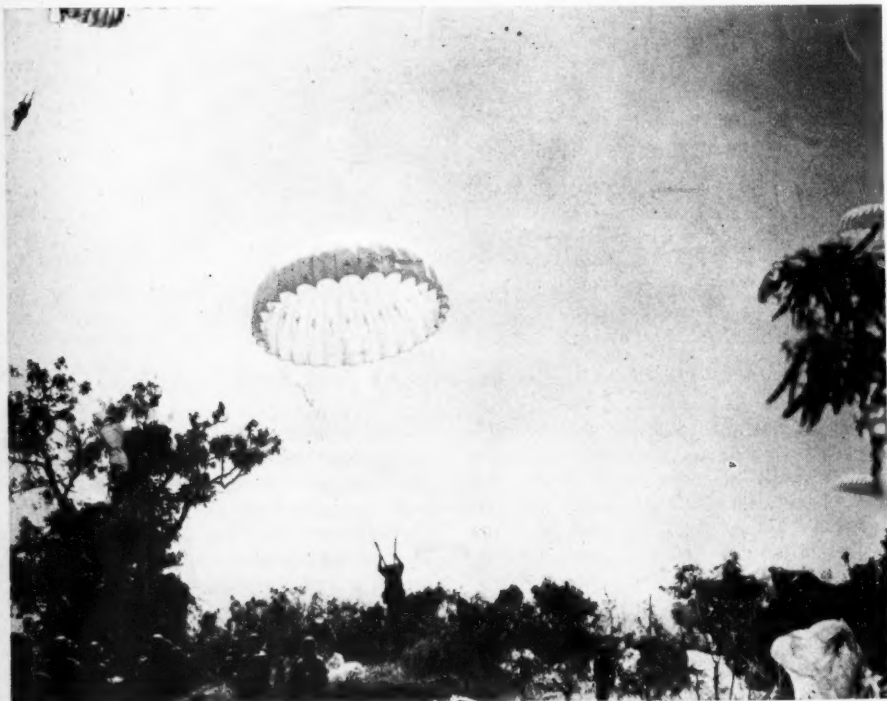


Figure 4.—Soldier lands by parachute on Corregidor. (U.S. Signal Corps photo.)

which thoroughly bombed and strafed the areas designated. The first combined air-ground missions were executed on the day the paratroops made their first landing.

Commendable caution was exercised in conducting all combined air-ground missions with the result that, although the area was most confining, not a single friendly casualty resulted from our own bombing and strafing. On each strike, the target was spotted by white-phosphorus artillery or mortar ammunition. On most targets a dry run was made to see whether the instructions of the Support Aircraft Party were being received correctly. No strafing was permitted within 1,000 yards of our own troops; and most runs were made from west to east along the island, in order to get better area coverage and avoid our troops. When bombing was carried out as close as 500 yards from our troops, the locations of the troops were marked by colored smoke.

Between 16 February and 3 March, a total of 407 sorties were flown in joint air-ground missions on Corregidor. As a result of these sorties, 466 500-pound demolition bombs and 55,500 gallons of napalm were dropped and 320,000 rounds of .50 caliber ammunition expended. On mission after mission our ground forces were able to take a position without opposition, after our fighters dive-bombed with 500-pound demolition bombs or glider-bombed with napalm-gasoline filled tanks, or both. Numerous instances were cited of enemy troops emerging from caves and dug-outs in an obviously dazed condition, thus being easy prey for our forces. Owing to the fact that practically all antiaircraft opposition had been eliminated, our fighters were able to make their attacks unmolested and with uncanny accuracy, oftentimes their bombs striking through the white-phosphorus smoke laid on the target.

By 1 March, the rotting Jap cadavers had attracted to the island hordes of flies which bothered our troops considerably. Hence, one C-47 airplane was dispatched to dust the eastern portion of the island with DDT, and on 2 March another C-47 dusting mission

was flown, an ironical twist to the military use of air power.

On 2 March, the retaking of Corregidor was virtually complete, and Generals MacArthur and Krueger and party attended a flag raising ceremony near the parade-ground area.

Summation

For the student of air power, the compactness of the air campaign against Corregidor Island makes it stand out in bold relief, as a shining example of the effectiveness of air power used properly. It is elementary that the attack on Corregidor could not have been successful without air superiority. Our own use of air forces against surface vessels have shown how helpless such vessels are when confronted with determined attacks by aircraft. Again, air was the medium which made possible the vertical assault on Corregidor by paratroops. There is no question but that aerial bombardment of Corregidor prior to the amphibious and paratroops landings enabled these operations to be carried out with a minimum of loss to our own ground forces, and to our naval forces as well. Records speak for themselves in denoting the effectiveness of our aircraft in joint assault with the ground troops. Time after time points of resistance collapsed under aerial pounding and our troops went in virtually standing up. Of no less importance is the effective welding of air, ground, and naval units into a single hard-hitting team, working jointly against the same objective. The air operation was outstanding, principally because the entire battle was built around an effective assault by air.

Even though the air played such a prominent part in the operation, no review of the retaking of Corregidor can possibly be made without giving credit to the navy for its share of the operation. It was naval effort that transported the amphibious force to Corregidor; it was the navy that provided rescue facilities in the event it was necessary to ditch from aircraft; it was the navy that concentrated so much gunfire on the



Figure 5.—View of Battery Geary on island of Corregidor. (U.S. Signal Corps photo.)

beaches and throughout other parts of the island during the preparatory stages of the operation; and it was the navy that furnished counterbattery and other gunfire on call after the amphibious landing was made.

Last, but by no means least, credit must be given to the paratroops. Theirs was the decision that the drop on Corregidor could be made. Theirs was the painstaking work of planning the operation on sand-table models and the estimate of the amount and type of supplies. They were the ones that said they could jump into the "postage stamp" drop zones; and they did it successfully. They

were the ones that cleaned out the island, mopping up and burning the Japanese pests they found scattered throughout the island. And too, they were the ones who suffered most of the casualties in the operation.

The failure to give credit to any of these three forces would be a failure in the accurate recording of the operation. None of the three could have accomplished the objective without the help of the other two; so let us acknowledge the fact that it was not one particular arm or service that won this important battle. It is very true that it was won by one force, and that one force was composed of soldiers, sailors, and airmen.

AAF Weather Service Reconverts to Peacetime Basis

ONE of the Army's most amazing "chain store" enterprises—an enterprise representing an initial installation outlay of close to \$40,000,000 and employing almost 18,000 highly trained officers and enlisted personnel—is being reconverted to a peacetime basis.

This enterprise is the Army Air Forces Weather Service, an independent AAF command with world headquarters at Asheville, North Carolina, which has mushroomed in size and significance from a thinly stretched string of forty-three stations manned by less than 300 personnel at the end of 1937 to an elaborate, globe-girdling network of 857 observation and forecasting units and 17,800 officers and men on VJ-day.

For administrative purposes, the world has been carved up into a jigsaw pattern of twenty-one weather regions, each composed of a number of observing and forecasting stations. Eight of these regions, embracing 323 stations and utilizing approximately 6,000 personnel, are situated in the continental United States. The other thirteen, with a total of 534 stations and approximately 12,000 officers and men, blanket the rest of the globe.

The largest number of stations was allotted to the European Theater of Operations, which was served by one regional organization with fifty fixed stations and another with fifty-nine mobile units to accompany advance forces in the smash through France, Belgium, and Germany. But the distinction of operating the most stations under a single command belongs to the China-Burma-India region, which had a string of ninety-six widely scattered units on VJ-day.

Other foreign regions, with the number of their stations at the close of the war: Central American, thirty-one; the Central Pacific, forty-seven; the North Atlantic, thirty-four;

the Caribbean, eighteen; the Aleutian Islands, twenty-four; the Mediterranean Theater, eighteen; the Southwest Pacific, sixty-four; Alaska and western Canada, thirty-seven; Africa and the Middle East, thirty-nine, and Brazil and the South Atlantic, fifteen.

The wartime network of stations built up by the AAF Weather Service is the closest approach in history to a world-wide reporting system. But the war is over. Men must be demobilized. Weather stations installed and developed in foreign countries must, for the most part, either be abandoned entirely or operated under new management.

In the interest of aviation, Weather Service officials are attempting to follow the latter alternative. They are turning over existing stations and equipment—much of which would quickly become obsolete if shipped back to the United States for storage—to the meteorological services in countries in which they are located. They are helping liberated nations rehabilitate their own weather services, and, in several notable instances, they have trained foreign groups in the science of weather observation in order to serve as a nucleus for future operations.

Reconversion policies followed by the Weather Service are in keeping with an agreement adopted by the fifty-two nations attending the International Civil Aviation Conference in Chicago last winter to establish a global weather network for service, without discrimination, to every country under the jurisdiction of a proposed international organization. If the plan goes into effect, each contracting state would commit itself to provide a meteorological establishment within its own borders comparable to that now maintained in the United States.—*From a release by the War Department Bureau of Public Relations Press Branch.*

It Wasn't in the T/O

LIEUTENANT COLONEL JOSEPH H. CHAILLE

G-1, 102d Infantry Division

LIKE a long line of scurrying ants they came, scrambling over the twisted wreckage of the bridge which they themselves had dropped into the River Elbe only a few days before. Hour after hour, in endless stream, this gray-clad horde of German soldiers filed by, some of them dirty and unshaven, but others, the rear echelon crowd, as smart as they ever were when they goose-stepped for Hitler. There was no goose-stepping now. Each man tossed his weapon in the mounting pile and jumped at the command of the German-speaking American private to his place at the tail of the long line which curved in and out to fill a near-by field. Periodically, groups of one or two hundred, led by their own German officers, started the march up the road to Stendal, unguarded because the American units had long since exhausted their capacity to furnish guards.

From the eastern bank of the Elbe, offering visibility for miles in the bright sunlight of the early May morning, stretched the treeless plain upon which was being enacted a vivid drama of the dying Nazi empire. That mass of soldiers at the eastern end of the bridge was the reservoir from which this motley stream of prisoners was being fed. Those hundreds of Wehrmacht vehicles, some of them blazing from direct hits of Russian shells, and countless horses running wildly into and out of view, had brought the Germans there. The Russians were coming, but how long before they would arrive to cut off the stream of men? Meanwhile, how could the Americans refuse to accept the surrender of an enemy who came under a flag of truce?

To a dazed G-1 watching that scene, the world was full of German prisoners of war; prisoners of war to be accepted, collected somewhere, fed somewhere. All the rear installations—corps, army, communications zone were clogged. No more evacuations. Divisions will take care of prisoners in their own inclosures. What inclosures?

That was probably the low point of the war for the G-1 who watched that scene on 6 May 1945, and who by nightfall had over 100,000 prisoners of war on his hands. The Russians mercifully arrived soon afterward and cut off the escape routes.

But that was not the first time that prisoners of war had presented problems not in the book. Nor were prisoners of war the only G-1 problems, during the campaigns from Holland to the Elbe, which could not be handled by personnel provided (or not provided) in the Tables of Organization.

The G-1 as an Improviser

Every general staff section believes that it has practically a corner on the troubles which can beset a division staff in combat. However, with the possible exception of the G-4's, the G-1's in the European Theater of Operations encountered more occasions for having to improvise means with which to carry out their functions than any of the others.

Tables of Organization either make no provision whatever or provide inadequately for the following G-1 functions, according to the experience of one division which entered combat in late October 1944 on the German-Netherlands border and was continuously in combat until the River Elbe was reached some 173 days later.

Collection and evacuation of prisoners of war.

Burials.

Casualty reporting.

Reception of replacements.

Special service, including unit exchanges.

Following is an account of the improvisations which had to be made to meet the situation of this division. Practically none of these solutions was original; most were a matter of general practice in Ninth Army, at least, and probably in other armies on the Western Front. A newly-arrived G-1, if he was smart

(and most were), called on G-1's of combat-experienced divisions in the vicinity, found out the troublesome points, and promptly recommended similar corrective measures to his commanding general.

Prisoners of War

To return to the subject with which this account opened, the final days of the war in Europe will long be remembered by G-1's as a nightmare of prisoners of war. After the crossing of the Roer River in the latter part of February 1945, there were never enough facilities for evacuating them. Although the military police platoons of all infantry divisions had been augmented to a figure approximately double the Tables of Organization strength of pre-invasion days, traffic problems had multiplied as rapidly as all others, and G-4's were always reaching for more military police to man traffic posts. In the 102d Infantry Division, it was the practice to attach a team of six MP's (all that could be spared for this duty) to each front-line regiment, with instructions to set up collecting points as designated by the regimental commanders, normally in the vicinity of regimental headquarters, so as to facilitate coordination between the Interrogator of Prisoners of War team and the regimental S-2. The division provost marshal evacuated from these points to a division inclosure, from which theoretically Army would evacuate farther to the rear. Actually, Army had no adequate evacuation facilities, and was able to render very little assistance following the Roer crossing, other than to attach a small group of army military police to help out at the division inclosure.

Even before the flood of prisoners received over the Elbe had arrived, the six MP's at the collecting point were inadequate to guard the large numbers of prisoners who surrendered or were captured daily, and the regiments were forced to detail combat troops to assist in guarding and in evacuation. After arrival of prisoners at the inclosure, the only way the provost marshal could get them off his hands was to stand in the main supply road, hail all empty vehicles headed for the rear,

and cram them full of prisoners (seventy-five to a 2½-ton truck was not an unusual load). Since the collecting point of the next higher echelon was not infrequently a hundred miles to the rear, the supply people were often unhappy at this diversion of transportation, but the prisoners were moved and nobody ever seemed to suffer too greatly from lack of supplies.

After the Elbe incident, of course the only answer was for each regiment, and the division artillery, to build an inclosure, comb the countryside for cooking facilities, and establish a prisoner-of-war camp from scratch.

Burials

Combat troops dislike collecting bodies, and there is a definite morale factor involved in requiring them to evacuate those of their own buddies. As for German dead, our combat soldiers could not understand why they should undertake the disagreeable and often dangerous task of removing enemy dead from the battlefield, and from the depths of the concrete pillboxes of the Siegfried Line. Nevertheless, available quartermaster graves registration troops in the European Theater of Operations could do no more than evacuate from division collecting points to cemeteries, and details from combat units had to collect the bodies and evacuate them to the division collecting point.

Initially, each infantry regiment was required to improvise a collecting detail consisting of one officer and twelve enlisted men. Experience proved that during most periods this number was excessive. A full-time detail of three men, augmented when casualties are heavy, is about right for a regiment. No great amount of experience or special training proved necessary, since the quartermaster graves registration platoons were able to perform most of the identification duties; and at no time was it necessary for divisional personnel to make burials, isolated or otherwise.

In cases where identification promised to be especially difficult, such as badly burned bodies in tanks, the unit collecting details

were instructed to call (through G-1) for assistance from the quartermaster graves registration platoon in removing the bodies, so that all possible means of identification might be studied on the spot by the experts. The number of bodies not eventually identified was extremely small.

Casualty Reporting

The Tables of Organization proved inadequate in respect to several aspects of casualty reporting. Not only did the division adjutant general find it necessary to establish a casualty section from non-T/O personnel (six clerks), but the larger subordinate units did likewise. Even so, it was a constant struggle to report casualties within time limits set by the Theater Commander, to maintain the records so as to reflect promptly and accurately such changes of status as "killed in action," instead of "missing in action," and to write the required letters of condolence.

The 102d Infantry Division adopted at the outset an expedient found useful by other divisions with longer combat experience. This was a "personnel inventory" taken at least once a week by all combat units.

No matter how good the casualty reporting system is, there will inevitably be a few casualties which are not reported promptly. The personnel inventory is designed to detect such cases before they become seriously delayed. Each squad leader, on a given day each week, writes on any convenient scrap of paper the names of the men in his squad who are physically present. The personnel officer checks these lists against his roster of men presumed to be present for duty. There are always discrepancies, and somebody must find out why. Here, another improvisation was found necessary. The regiments in which this plan operated most successfully used a non-T/O liaison officer between the regimental S-1 and the personnel officer. Most of this officer's time was spent in finding out from the people on the ground exactly what had become of Private John Jones, who was not listed by his squad leader on the latest inventory, but who was still indicated on the personnel officer's records as present for duty.

In a great many instances Private Jones had become a casualty but, because of one of many mishaps which can occur in dealing with casualty data, had not been reported as such. A timely follow-up saved many a unit commander the embarrassment of explaining an undue delay in reporting a casualty.

Reception of Replacements

When replacements arrived fresh from the United States, the regiments which needed them worst were committed to action and were in no position to receive newcomers, check their equipment, and prepare them mentally for combat. Their future squad leaders and platoon leaders were in foxholes, under fire. The regimental commander would yell over the telephone, "Of course I need replacements, but I can't take them now. Hold them for a few days." What could the G-1 do next?

The 102d Infantry Division found it necessary to set up a reception center with a capacity for 600 men. Obtaining the personnel to operate it and the equipment to house and feed 600 men was no easy matter, but the effort proved well worth while. Mess equipment, initially taken from infantry units, was later replaced by captured German mess equipment. Overhead personnel on special duty was rotated, so as to give the replacements the benefit of consulting with men who had very recently experienced combat. Replacements were retained in the reception center a minimum of three days. A special effort was made to welcome them, and to make them feel that they really belonged. To men who had spent weeks as casuuals, this feeling of having found a home was a very real morale factor, as was attested by the censors from remarks made by the new men in their first letters home.

In the reception center, the men were given an opportunity to sew on their division patches, to send V-mail changes of address home, and to change their French money for Allied military marks. They received a partial pay, if, as was the case with many, they had not been paid over a long period. Their equipment was checked, and they received a

physical examination and any missing immunizations. Then followed an intensive period of practical refresher training, under officers and noncommissioned officers who had been in the lines themselves only a few days before. No matter how thoroughly the replacements had been trained previously, they were eager to listen to tips on how to stay alive and in good health under battle conditions in northwest Germany in the spring of 1945.

Special Service

The one officer and three enlisted men provided for the Division Special Service Section proved completely inadequate. It was found necessary to provide one officer and six enlisted men as the minimum augmentation necessary for exchange activities alone.

An alert, aggressive special service officer is one of the most valuable assets a G-1 can have, and it is a mistake to let him be diverted to other duties, or not to give him the personnel needed to carry out his functions. Even during the most active combat, regiments and battalions in reserve need motion

pictures, unit exchange service, Red Cross clubmobiles, and every other form of diversion and relaxation which can be devised. During relatively quiet periods in the combat picture, a special service section three times as large as that provided by the Tables of Organization would find it difficult to provide the services needed by the troops.

How Many on SD is Too Many?

The conscientious G-1, bearing in mind that every man on special duty means one less man with a rifle, finds it painful to recommend building up large non-T/O organizations which are essentially non-combat in nature. On the other hand, he fails in his full duty to the division commander if, upon finding that a given G-1 function cannot properly be performed with the means provided in the Tables of Organization, he does not recommend augmentation to the necessary extent. Properly performed G-1 functions can contribute greatly to the combat efficiency of a command, and no G-1 need feel apologetic over insisting that his agencies be given the means with which to carry out their missions.

Postwar Minesweeping

A hundred British minesweepers are engaged on the greatest sweep of the war—the clearance of the vast defensive mine barriers laid round the shores of Britain to protect coastwise shipping. A hundred thousand moored mines were laid in these barriers during the war and, although some broke away in gales and drifted ashore, many thousands still remain. In addition, there are hundreds of enemy ground mines—magnetic and acoustic or a combination of both—which lie outside the war channels and were not swept during hostilities. Large areas have already been cleared to allow free passage for ships and fishing craft, but the task ahead of the minesweepers is still formidable.

The mines in these fields are being cut and sunk, for they have little value as scrap. The TNT with which they are filled would be worth little, and there is nothing in their cases that would repay the cost and labor of salvage.

In addition to the eleven flotillas at present engaged, twenty-two special minesweepers have been built to operate in shallow waters. Sweeping will be restricted during the winter months. The main effort will be made in the summer of 1946.—*Digested at the Command and General Staff School from an article in "The Fighting Forces" (Great Britain) October 1945.*

The Field Artillery Group Organization and Operation in Combat

COLONEL DONALD B. HARRIOTT
203d Field Artillery Group

IN this ever-changing world of ours it was natural for the component parts of our Army to change, that they might keep pace and up to date with global military evolution. The Field Artillery Group is no exception to this universal rule. It was first introduced in an attempt to gain a certain flexibility not present in the old regimental setup and, like the proverbial pendulum, it swung over to the opposite extreme. We now see the pendulum gradually coming to rest somewhere in the logical center where everyone hoped it would be when the Group was first created.

Except for a few die-hards, all artillerymen welcomed the versatility of the new Group, but practically all deplored the loss of esprit and morale which was a traditional part of the old regiment. Fortunately, the trend today seems to be back toward the regaining of that prestige so inherent in the regiment, at the same time retaining the flexibility of the Group organization. The crucible of combat has perhaps crystalized the need for a rebirth along those lines more than any other factor. Certainly some move toward a more permanent relationship between certain organic battalions and the Group is indicated. There are many proposed methods of obtaining this permanency. Many Group commanders, after long months of battling the present arrangement, feel that the Group should be set up as a general support or reinforcing type. In the former would be grouped the heavier calibers, and the latter would encompass those calibers normally used in reinforcing roles. Not less than two organic battalions per Group should be normal in the general support type, while three or four might be assigned to reinforcing type. In such an organization for combat, additional battalions could be absorbed for a temporary attachment but continue to look to their parent Group organization for administration and eventual return home when the temporary mission was concluded. Operational control for tactical purposes only is

not in the realm of impossibility, because it has actually worked in combat. Normally it takes at least a month, especially under combat conditions, for a Group headquarters and a newly attached battalion to become a well-coordinated team. Yet generally the battalion with much longer than a thirty-day home on the Group range unfortunately is only a medial one. During many months in combat the average length of time that a battalion remained under control of the Group in the experience of the writer was thirty-five days, the shortest being one day and the longest 102 days. In most cases, when the Group-Battalion team operated as a well-oiled machine the relationship was split asunder.

The Field Artillery Group, which the author has had the pleasure to know intimately since its first activation as a regiment and later rebirth as a Group, is in an excellent position to become the guide for a commentary on the employment of such an organization in combat. In the European Theater alone this unit served under three separate armies and three different corps with one field artillery brigade thrown in for good measure. It worked in a reinforcing or attached role with eight infantry divisions, one airborne division, and one armored division, as well as one cavalry group. It employed twenty-one field artillery battalions of nine different types varying from 240-mm to 105-mm self-propelled howitzers. The Group participated in siege operations before the fortress Metz. It was rushed into the Battle of the Bulge before beleaguered Bastogne, serving in both the defensive and later offensive phases. The organization took part in the rapid and fluid operations in France, across Belgium, and through Luxembourg, and in the final dash across Germany which on VE-day ended at the threshold of Czechoslovakia.

In presenting the problems confronted and the techniques employed by this Group under actual combat conditions, it was felt that by

breaking down the material into the experiences and lessons learned by the various staff sections, the reader would be afforded an opportunity to receive a better understanding and at the same time formulate more definite conclusions relative to the success or failure of the Group system. Unavoidably, the theme throughout will indicate a desire for a return to that certain something which cannot be commanded but is always freely given—namely, the esprit de corps inherent in the regimental system. The author has leaned heavily on each staff section in the preparation of this article and it will be apparent to the reader that in the opinion of all sections the Group principle is basically sound, although each expresses a keen desire for a more permanent Group-Battalion organization.

Intelligence and Survey

The Group S-2 section was composed of the following organic personnel: one major (S-2); one captain (Assistant S-2); one technical sergeant (Intelligence Sergeant); one sergeant (Liaison Sergeant). The S-2 and S-3 section comprising the Operations Section of the Group Headquarters being so very closely associated made it possible for a schedule of duty hours to be worked out for the enlisted men whereby no one man had to perform duty for too long a period. All men of the Operations Section were familiar enough with aspects of S-3 and S-2 work to execute properly a job in either section.

The following scales of situation maps were kept: 1/50,000 (not available during last stages of the war) showing the picture on the corps front; 1/100,000 showing the picture on our corps and flanking corps fronts; 1/250,000 showing the picture on our army and flanking army fronts; 1/1,000,000 showing the general big picture on both western and eastern fronts.

In addition, whenever one of the attached battalions or the Group was employed in a reinforcing mission, a 1/25,000 situation was kept of the division sector.

Experience has been that the 1/50,000-scale

map is the best suited for Group Headquarters operations. Most of our attached battalions have also found this true, except that the 1/25,000 was preferred for vertical control chart, survey work, and detailed reconnaissance.

Our various sources of information were as follows: air and ground OP's [observation posts]; attached battalion S-2's; liaison officers with reinforced unit; division artillery S-2's; division and corps war rooms. It was found in this connection that the most accurate and reliable sources of information were the infantry regiments and battalions.

At approximately 1800 hours each day, overlays were distributed to each battalion giving the latest front-line information. All friendly and enemy information was telephoned to Corps Artillery S-2 as it was received in the Group Headquarters. An S-2 Journal was kept for the purpose of recording this information.

It was found that some new battalions did not include in their telephone reports all the important elements of enemy information. In these cases the battalions were required to submit a written confirmation of their reports to this headquarters each day in order to groove them in the current method of reporting.

Group observation was coordinated by the Group S-2 by assigning zones of observation to each battalion. Normally these zones coincided with the zones of fire. Unless a battalion had a reinforcing mission which required forward observers, the battalions were required to have two OP's—one manned twenty-four hours per day and the other during daylight hours only. The latter was also used as a training ground for battalion observers.

When the situation was static, Group organized a flash base using battalion OP's of three battalions and setting up a flash terminal in vicinity of the center OP. Telephone lines were brought into the flash terminal switchboard from each OP and lines were laid to the nearest battalion switchboard thus completing communications between the flash terminal and Group FDC [fire-direction cen-

ter]. The purpose of this flash base was twofold: first, to get intersections on enemy gun batteries, and secondly, to provide another means of registration for the battalions using CI [center of impact] or high burst methods. Experience proved the value of the flash base when the base secured an intersection on an enemy battery harassing a firing battery within the Group. The enemy battery was taken under fire, and as a result the harassing fire ceased. This represents only one illustration of the many missions fired through this means.

Survey was coordinated among battalions by the Group Assistant S-2 in so far as bringing the survey of each battalion under corps control. Trig lists and locations of SIC's were secured and forwarded immediately to the battalions. Survey using a 1/100,000 map was found to be very difficult due to inaccuracies and distortion of the maps; 1/25,000 maps are best.

Using the universal form, shell reports were telephoned immediately to Group S-2, who forwarded the information to the corps artillery counterbattery intelligence officer at once. It was emphasized that, although a full shell report was impracticable to secure at once, the fragmentary information was so important that no time should be lost in reporting the incoming rounds.

The Group S-2 section must attempt at all times to anticipate future map coverage requirements. As soon as these anticipations materialized at all, requisitions for Group Headquarters and all battalions were promptly made to corps map depot. Although the situation moved very rapidly in the final phases of the war, Group still had adequate map coverage. A map supply record was kept showing at all times the number of maps on hand and the officers and men to whom maps had been issued within the Group Headquarters.

All classified documents were registered by the journal clerk as they were received, and were kept in the FDC where there was always a man on duty. When these documents were destroyed, an officer certified by signature

the destruction. For security purposes, thermite grenades and gasoline were always available in the command post for quick destruction of all important information in the event of imminent capture by the enemy.

A briefing session was held each evening for all members of the staff. This was particularly important since it was a means whereby the special staff, such as chaplains, dental officers, and key enlisted personnel, could be kept up to date and familiar with the current situation. The briefing was enthusiastically received and grew into one of the highlights of the day.

The principles upon which the S-2 section operated were based on and adjusted to combat experience; therefore, they appear to be sound.

Plans and Operation

The operation of the Group S-3 section is not unlike that of division artillery, the main differences, of course, being the result of having different type missions and, in most cases, heavier caliber matériel. However, the existing principles and practices relating to the deliverance of artillery fires are standing operating procedure in the Group. There are, however, several things worthy of mention that have contributed greatly to the efficient operation of the fire-direction center; in the main, they are peculiarities of method, tried and, we believe, proved in our operations in this theater.

The Group always operated with a BD-71 switchboard in the FDC; lines direct from battalion FDC's and Corps Artillery (or other higher headquarters) FDC are double-jacked through our main BD-72 switchboard into the FDC switchboard. By this means, it was possible to coordinate the fires of several battalions with a minimum of delay; the advantages of this system were especially apparent whenever firing TOT's with division artillery or other corps artillery groups. In addition, it reduced the number of telephone operators needed, releasing personnel for other necessary duties; at the same time the drop indicates the exact party calling, thus

eliminating the confusion that normally arises from many individual telephones.

To enable the liaison planes to cover their zone of observation with maximum efficiency, without losing any time in the firing of an air-OP target, direct radio communication between all planes and the FDC was maintained by means of a built-in loudspeaker for radio remote control. For all practical purposes the radio was in the FDC even though the set was actually located in the best available site in the near vicinity. A target located by an air observer was quickly checked against the fire possibilities by the Group S-3, who immediately assigned the mission to the battalion best able to handle it. This, again, added greatly in the coordination and massing of the fires of the Group and eliminated duplication of effort on the part of the air observers and battalions alike.

The Group S-3 also found it good practice to keep an up-to-date check on the amounts of ammunition on hand in the battalions. By so doing he was able to plan fires more intelligently and also keep the commanding officer and S-4 advised on the ammunition situation. A record of all missions fired was also kept in the Group FDC, thus giving the commander and all staff officers concerned a better picture of the enemy situation; in addition, it assisted in the composition of the necessary S-3 reports to higher headquarters.

It was also a practice to advise lower units, as well as higher, of a change in the Group's location as quickly as possible; this, of course, also applied to the battalions keeping the Group posted on their changes in location. This practice is absolutely necessary, especially in a fluid situation.

Generally speaking, all thoughts were directed toward the massing of the greatest amount of artillery in the shortest possible time; the importance of the target, of course, dictating the amount needed.

Especial attention must be given to a relief system that will enable all personnel to obtain a maximum of rest. Otherwise, the well-known enemy, "battle fatigue," will eliminate your most valuable officers and enlisted men.

It must be stressed that experienced replacements are difficult to obtain in the combat zone. Meticulous attention was always devoted to the training of all junior field artillery officers of the Group in fire-direction technique, which paid wonderful dividends.

It was always found advisable to keep our forward FDC packed and ready to move to the new location with a minimum of delay. The forward FDC consisted of a $\frac{1}{4}$ -ton weapons carrier and a $\frac{1}{4}$ -ton C&R [command and reconnaissance car] with both a 608 and 284 radio, the 284 being used to supplement communications with the rear when the distance was too great for the 608. (An additional SCR-193 radio should be included in the Group T/O for use of the forward FDC in communicating to the rear, for receiving latest metro messages in the forward position, and also as a spare.) Cub planes were extensively employed for relaying messages in fluid situations and solved many a difficult problem in preventing communication failures.

The Group which does not keep a "new battalion file" constantly up to date is making a mistake. Sufficient copies of the Group operations policies conforming to the Corps Artillery SOP should be available at all times so that when greeting a new battalion in the heat of battle, which is normal, many words can be saved. Such general instructions as apply to operations, intelligence, communications, air liaison sections, reports, and supply are dispensed with quickly and commanders can devote themselves to the job of placing the big bullets on the enemy with greater facility. It was found that upon inauguration of such a system the business of quickly becoming a coordinated group-battalion team was greatly enhanced.

The Piper Cubs

The combat experience of this Group showed that the Group Air Officer should be notified as soon as a forward displacement was expected, so that he could proceed to the new location without delay to select a strip. The most successful method used was for a plane to fly to the new location, assist in

selecting a strip from the air, and when it was located, for the Air Officer to make a ground inspection, and, if suitable, notify the plane to land. To accomplish this, of course, it was essential for the Air Officer to be provided with a radio.

It is a proven policy in this Group that the Air Officer or pilot pick all strips, since a pilot knows the characteristics of his plane, requirements for a strip, and obstacles to be avoided. In many units, fatal accidents have been caused by improper selection by groundlings.

Through experience in combat, the Group policy was adopted that no pilot be ordered to fly by a ground officer when the pilot knew the weather or field to be unsafe. In emergencies where flights were necessary under these conditions, normally a Group pilot flew the mission.

It was found that at least one Group observer should be assigned to the Air Section and operate with it to the exclusion of other duties. Likewise, each battalion should furnish two permanent observers. Officer observers were found to be most suitable. By remaining with their sections, each pilot-observer unit became a well-functioning, closely-knit team. It was unfortunate that this practice was not followed in peacetime training, since upon arrival in the combat zone an observer normally required at least a week before he could efficiently read and properly follow a map or photo from the air. In addition, it was found that several days elapsed before pilot and observer became a well-oiled machine working together.

The schedule of flights was posted the previous day so each team could know the time of its flights. As a rule the duration of each flight was one hour and fifteen minutes except when conducting a fire mission. During this Group's many months of continuous combat it was noted that a pilot's efficiency was greatly decreased because of fatigue. Therefore the flights were kept under one hour and thirty minutes, and each team made three flights a day. Surprisingly enough, observer fatigue usually occurred prior to pilot

fatigue. Pilot-observer rest camps, never available to this Group, should be established.

A remote control radio unit was set up in the FDC near the S-2 and S-3 and controlled by the Air Officer, who should be considered a tactical adviser first and a pilot second. He acted as air coordinator between the S-2, S-3, and pilot-observer teams. With these three vital sections boot to boot, no time was lost in evaluating and acting on all information received from and transmitted to the air observer pilots.

Each pilot-observer team had a permanent number used with the Group daily call letters, and each battalion FDC was assigned a permanent number used with the battalion daily call letters. Prior to each flight, every team was briefed by the Air Officer on the latest S-2 and S-3 situation covering latest front lines and special area to be observed. Upon completion of the flight the team reported to the Air Officer, confirming all enemy information reported by radio, all S-3 information, and areas discovered to be dangerous for flying.

In the latter stages of the combat period it was clearly evident that in fluid situations the airplanes should be released to their battalions. The battalion planes were of inestimable value to their own organizations, not only for registrations but also for reconnaissance purposes. When the situation became stable again, all battalion sections returned to Group where centralization of control permitted better supply and feeding of the sections, and more efficient supervision. Except for a short period, all sections were provided high-octane gasoline, even when most units were using truck gas. This was due, in the main, to centralization of control under Group which resulted in more efficient supply procedure. It was unfortunate that the Group never retained most battalions more than a month or two. Every Group Air SOP was different, and much time was wasted in indoctrinating the newly attached sections with the Group policies.

The Group commander always announced his policy relative to flying across the known

enemy front lines to each newly attached battalion air section: Any mission which would require an air observer-pilot to fly into enemy territory and beyond our own front lines was a target for the Air Corps, not the artillery, and such heroics would not be permitted. This announcement was very probably a contributing reason to the fact that 1,359 combat sorties were flown in the European Theater without a major accident or the loss of a life.

Supply and Administration

Supply.—The supply department of the field artillery group under T/O & E 6-12, 29 October 1943, consisted of one major (S-4), one master sergeant (supply), and one technician grade 5 (supply clerk). T/O & E 6-12, 20 October 1944, added a captain (Assistant S-4 and Group motor officer).

The primary duty of the Group S-4 was to insure that the attached battalions were informed at all times of the location of supply points for all classes of supply. In stable situations this naturally presented no problem, but in moving situations very close liaison with both higher and subordinate headquarters was required.

Although the Group S-4 is not directly in the chain of supply, it is his duty to insure compliance by attached units with all supply directives from higher headquarters. This was done as the tactical situation permitted by close contact with S-4's of attached units.

Assurance that attached units are receiving proper supplies and service is of concern to the Group S-4. Routine day-by-day supply, such as Class I and III, normally presents no problem. Class V is usually capably handled by the corps artillery headquarters, and merely resolves into keeping the amounts on hand as required by the corps. Class V requirements were cleared through the Group on the day prior to the day it was to be hauled, while the Group in turn cleared through the corps to determine availability at the proper ASP [ammunition supply point].

In combat, ordnance supply and service

requires close attention by the Group S-4. Again while the Group is not directly in the supply channel, close cooperation and patience with the supporting ordnance establishments pays dividends. A systematic discussion and organization of ordnance service with the ordnance company commander, with due consideration for any limitations of either the ordnance or the field artillery, results in more effective ordnance service.

Ordnance units differ in the handling of contact parties for artillery. From the artilleryman's standpoint, the preferred method is the contact party that lives and travels with the artillery battalion or group. This insures not only a daily contact, but also immediate service in an emergency.

There is no tactical operation which does not present a supply problem peculiar in itself. Depending upon the season, terrain, climate, and mission, there is generally one specific item common to all units requiring the close attention of S-4's. As examples, during the winter season and the Ardennes campaign, grousers for tracked vehicles were scarce initially. The drive to and across the Rhine caused severe wear on tracks, bogies, and idlers of tracked vehicles. Heavy artillery has its equilibrator problems. In these cases, close liaison with the Corps Artillery S-4 is essential in addition to aggressive individual action by battalions.

The addition of the assistant S-4, motor officer, to the Group gave the necessary punch to the section. This officer can concentrate on motors as a whole, and also be prepared for other supply duties. In its present stage the supply section seems to be a well-rounded department.

Administration.—Groups operated for approximately a year with no T/O & E provisions for administration. However, the lack of personnel to perform the duties did not serve to exclude administration from the Group. The commander's responsibility for administration was ever present. This very fact that Groups never ceased to be administrative apparently led to the new authorization of a captain (S-1), sergeant major,

personnel sergeant, classification sergeant, one records clerk, and two clerk typists.

Prior to the new authorization, Groups were forced to operate administration by shorting some other department, not only to centralize the volume of administrative matters but also to gain the proper command control. Methods varied. Although various methods were tried, a workable solution adopted by this Group was to delegate the duties to the S-4, who was the most logical administrative man. As an assistant, he was given the headquarters clerk, who acted as sergeant major.

The new T/O & E relieves the S-4 of these duties by allowing the necessary administrative personnel. As yet, there has been no clarification as to the specific manner in which this section should be employed. It is felt that this is worthy of consideration for reasons of standardization. Until such time as an approved solution appears, this Group plans to operate generally as follows: (a) The sergeant major, with his records clerk and typist, to control all administrative matters of a general nature, and to establish the proper suspense system to insure compliance by all concerned with directives from higher headquarters. (b) The personnel sergeant, with his classification clerk and typist, to initiate a continuous check of records of all units in such a manner that they are working with and assisting some unit at all times.

New battalions invariably asked, "What does Group want to go through it?" This indicated lack of standardization between Groups. The answer to this question under the present organization should be "everything," inasmuch as the Group is now organized to handle it. Yet there are still matters, purely administrative and of concern to the Group Commander, that skip the Group in the chain.

It is not felt that transportation now authorized is adequate. The supply and administrative section should be authorized an additional $\frac{3}{4}$ -ton weapons carrier and a one-ton trailer.

The supply and administrative section

rarely experienced the satisfaction of a job thoroughly completed for a battalion. Frequently it organized assistance and had the problems about fifty per cent solved when the battalion was snatched away. The Group was left hanging in mid-air among clouds of frustration, and the battalion was forced to start anew. This ever-present situation did not restrain the efforts of the supply and administrative section as it plunged headlong into the problems of the next battalion, but it created an undesirable situation. The permanency of assigned battalions would result in the highest degree of administrative efficiency.

Communications

"Yes sir, we can do it." That was a statement from a communication chief speaking for his platoon. In that brief statement radiates the spirit of an organization that has operated successfully under practically every conceivable condition. The field artillery group communication platoon is small for the tasks that it is often called upon to perform, and if the men realize the problem and the meaning of its successful completion a great pride in the organization will be automatically born.

Many and varied are the battalions in the field artillery group—from the steady 240-mm howitzer to the darting, slashing 105-mm SP. All of which keeps the key men constantly on the alert for changing events, and they in turn must be continuously informed on the situation.

When a battalion moves, the personnel concerned with wire should always be on the lookout for any switchboard in the new area, and promptly tie the battalion into that board for a lateral means of communication. During the winter months when the snow was deep and field wire troubles reached their peak, it was found that the answer to the problem of continuous wire communication was to run lateral lines between battalions. Wire-laying in combat is not altogether a matter of speed. Emphasis placed on complete servicing of the line while it is being laid, memorizing the route, and frequent test stations will make

trouble-shooting a simple problem. Men skilled in the use of the pike pole speed the line and also reduce the casualty rate. It was found that a man in a tree tying a wire made an excellent target for enemy snipers. Many times the wire section was under strength, thus calling for other men in the battery to be familiar with wire-laying principles.

It was found very early in combat that a more rapid and satisfactory means of radio control between the air observer and the battalion FDC's was needed to fire a mission effectively. To obtain this goal, the anti-howl button on the RM-29-A was replaced by a small relay connected to two binding posts from which wire was run into the FDC. This relay being powered by a battery BA-2 permitted a switch at the FDC to start the transmitter of the radio, thus eliminating a man at the anti-howl button. A loud speaker (LS-3), powered by a battery BA-40, was placed in the FDC to allow the Air Officer and S-3 to control the planes and monitor the fire missions. This device also allowed the radio section to be placed in the most suitable place for operation. This "juke box" proved to be the approved solution for bringing the S-2, S-3, and Air Officer into one camp. The radio section maintained good distances on the SCR-608's throughout combat by aggressively shifting their sets to better locations, and also by placing the antenna on the tops of poles, trees, and even the roofs of houses.

The Field Artillery Group was authorized, by letter, a light track vehicle appropriately called "the Creep" in this Group. The vehicle was authorized for wire-laying, but upon noting its fragile structure it was decided that the 12-volt electrical system would be of more value to the radio section. This proved the case, and in addition its flotation qualities permitted the selection of more advantageous positions for the radio station.

Conclusions

From prolonged combat, working under so many varied conditions and with numerous types of matériel, certain definite conclusions are forcibly impressed upon the individual. These conclusions are herein submitted as

recommendations based on lessons learned the hard way in actual combat.

Air.—Well-trained, coordinated pilot-observer teams in the organization are definitely essential.

A decided emphasis should be placed on increasing the training of the pilot to further his ability to adjust the map to the terrain.

All officers, and particularly the observer member of the team, should be given an opportunity to fire as many Air-OP problems as possible prior to combat.

Communications.—An increased amount of training of wire sections in laying and maintaining wire, especially at night, in strange terrain, over streams and simulated bombed and mined areas, is apparent.

Combat experience proved that more trained radio technicians are a vital necessity and that more training in radio procedure and meanings of fire-control expressions is imperative.

Lateral lines to battalions and a line to all near-by tactical units is the answer to many communication difficulties.

Operations.—Training in map reading for all personnel, especially drivers, should be intensified.

Definite emphasis should be placed on closer cooperation between field artillery and observation battalions during peacetime and training periods prior to combat. This would pay tremendous dividends in time of need.

An additional SCR-193 radio, primarily for use by the forward FDC, is of greatest importance in the Group setup.

The acquisition of another $\frac{1}{2}$ -ton weapons carrier and 1-ton trailer would solve the transportation problem of this department.

In general, more time should be allowed for further training of enlisted personnel in the operation of the FDC and unit reports.

Supply and Administration.—Because of increased personnel in this section, the addition of a $\frac{1}{2}$ -ton weapons carrier and 1-ton trailer is of prime importance.

General.—It is strongly recommended that serious consideration be given the establishment of a more permanent Group-Battalion setup.

Selective Service Rejections During World War II

ONE-THIRD of America's young men were unfit for usefulness in the armed services in World War II. The number of Selective Service registrants aged 18 to 37 who were rejected for mental or physical defects, including educational deficiency, was approximately 5,000,000.

These were "incapable of qualifying at the lowest level that can be established for men to be utilized," Colonel Leonard G. Rowntree, chief of the medical division, Selective Service System, has testified. Projecting the findings to cover 22,000,000 registrants under 38, many of whom were not examined because they were awaiting call or were in deferred classes, it has been officially estimated that 8,200,000 of that number were unfit.

The National Committee on Physical Fitness, acting in conjunction with a committee of the American Medical Association, envisions a program which "includes evaluation of the physical state of our young men and women, and would increase the activities and responsibilities of schools and colleges in physical education."

During a selected period of twelve months in the middle of the war, the rate of rejection for the armed forces on account of educational deficiency was one in every fifty white registrants and one in every ten negro registrants examined.

Unable to read or write as well as a child completing the fourth grade in school, these men are distinct from others rejected for feeble-mindedness or unspecified mental deficiency, and from others affected with mental diseases.

Among enlisted men in the Army, figures based on a sampling of about 7,000,000 show that nearly one in three had had only eight years of schooling or less. About one in thirty had had only four years or less. Even among Army enlisted men aged 25 or under, nearly one in four had schooling of only eight grades or less. The proportions in the Navy, Marine Corps, and Coast Guard are not greatly at variance, and do not materially change the total picture.

State and regional differences are striking. Generally the southeastern states exhibited the highest rejection rates for both whites and negroes, as well as the greatest proportions of Army enlisted men at the lowest levels of education. In one of these states one negro in four was rejected for educational deficiency.

Lowest rejection rates and smallest proportions of enlisted men at low levels of education appeared generally in the Far West and Northwest, and in urbanized localities along the North Atlantic Coast. In New York City only one registrant in thirty was educationally unfit.—*From a News Report.*

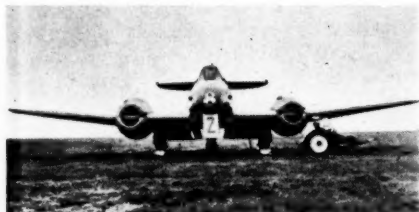
MILITARY NOTES

AROUND THE WORLD

GREAT BRITAIN

"Meteor" Jet Fighter:

The Meteor is a single-seat fighter aircraft powered with two gas jet turbine Weland or Derwent engines manufactured by Rolls-Royce.



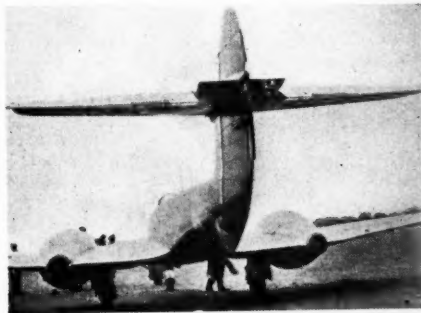
The aircraft was designed and constructed by the Gloster Aircraft Company from the experience gained in the design and construction and flight testing of the E28/39, which was the first jet turbine-propelled aircraft to fly successfully in this country [England] and possibly in the world.

The Meteor is a low-wing monoplane of all-metal construction with tricycle alighting gear. It is constructed of separate units, these being fuselage nose, front fuselage with nose wheel, center section (embodying center plane with the two undercarriage units and the two nacelles), the outer plane with aileron, rear fuselage complete with tail portion, and the tail unit which consists of the upper fin, upper and lower rudders, tailplane, and the two "half-elevators."

All components are of stress-skin construction. The high tailplane, necessitated

by the jet from the propelling nozzles, splits the rudder into two parts. The hydraulically operated lever suspension alighting gear consists of two independent undercarriage units which retract inboard and a nose wheel unit which retracts rearwards, the wheel itself being housed between the rudder pedals in the front fuselage.

The engine-driven hydraulic pump operates the alighting gear, flaps, and air



brakes. An emergency hand pump will operate all services.

The armament consists of four 20-mm Hispano guns. A camera gun is mounted in the fuselage nose fairing and the control for this camera is incorporated in the gun button and may be used without the guns if required.

The main dimensions of the Meteor are: span, forty-three feet; length, forty-one feet;

height, thirteen feet; wing area, 374 square feet.

The Meteor first flew in 1943 and was used against the flying bombs in 1944. The aircraft is very maneuverable and the landing speed is not high. There is very little noise in the cockpit in flight and the usual vibration is absent. Engine controls are simpler than with reciprocating engines.

(Flight, Great Britain)

"Frog-Men":

The principal task of Britain's "Frogmen" was to blast a hole in the Nazis' Atlantic Wall and enable the invasion craft to reach the Normandy beaches on D-day. Some of the



men had previously served in midget submarines and the human torpedoes. For many months experiments in the training of the men for under-water work were secretly carried out. Then in January 1944 the "Land-

ing Craft Obstacle Clearance Units," official name for the "frog-men," was started in the little village of Appledore on the North Devon coast. In their thin rubber diving suits fitted with helmets and breathing apparatus, and with huge rubber fins attached to their feet, these fantastic Wellsian figures steadily worked and trained for one of the most hazardous operations of the war. Their moment began at H-hour on D-day, when ten units (four Royal Navy and six Royal Marines), consisting of about 120 officers and men, went into action and remained until the underwater defenses had been cleared.

Apart from the invasion of Normandy, two units of "frog-men" were in action in the South of France landings, and three at Walcheren.

(The Sphere, Great Britain)

GERMANY

Latest German Air Weapons:

Fantastic designs were produced by the Germans in the latter stages of the Battle of Germany, for anti-bomber aircraft. Among these piloted missiles was "Natter," which was a rocket-propelled fighter and suicide-ramming airplane with a maximum speed of more than 600 miles per hour. Another contemplated rocket-propelled machine had a maximum speed of 1,700 miles per hour at 100,000 feet. For photographic reconnaissance, the Germans produced a powered glider intended for very high-altitude operations. Other German rocket secrets were dug up from six coffins at Lübeck, where they had been hidden by a Dr. Wasch. Even the clergymen who had conducted the detailed burial service were ignorant as to the real contents of the coffins. Among the most interesting of the drawings and prototypes was an anti-aircraft rocket which was guided to its target by infra-red rays emitted from the bomber's aeromotors. Wasch referred to this device as the "butterfly."

(The Aeroplane, Great Britain)

German War Casualties:

An official return, discovered by the Allies among the captured German archives, gives details of the casualties suffered by the German armed forces in the war. The period covered is only from the beginning of the war in September 1939 to 30 November 1944, so that there are no figures for the Ardennes offensive or for the combined Allied drives into Germany from east and west which brought about the final collapse of the enemy. The full total, therefore, can only be estimated, but it is possible from the details given to arrive at a reasonably accurate approximation.

There remains the question as to how far the figures in the returns are accurate, for all German statistics under the Nazi regime have rightly become suspect. All that can safely be said under this head is that these figures may certainly be taken as a minimum, or in other words that the German losses were not less, though they may quite possibly have been more than those shown in the document.

According to the return, the total of killed was 1,911,000, of missing and interned (most of whom may be assumed to be dead) 1,435,000, and of prisoners of war 278,000; and of discharged (unfit for further service) 438,000. This gives a grand total of 4,062,000. In addition, there were at the date of the return 774,000 men in hospitals.

Figures are also given of the losses in the various theaters of war as follows:

	Killed	Missing and Prisoners
Western Front and Poland (up to D-day) -----	66,000	3,000
Western Front (D-day to 30 November 1944) ---	54,000	338,000
Africa -----	12,000	90,000
Italy -----	48,000	97,000
Balkans -----	24,000	12,000

Russia -----	1,419,000	907,000
Inside Germany (air raids, hospital deaths, etc.) --	64,000	1,000
Total	1,687,000	1,448,000
Grand Total	3,135,000	

It will be noticed that this figure falls short by nearly a million of the grand total given above.

(The Tank, Great Britain)

Heinkel 162:

Germany's Air Marshal called the Heinkel 162 jet-propelled single-place fighter "one of our foremost secret weapons," when it first appeared in combat on 4 April 1945. Called *Volksjaeger* (People's Fighter), the plane was used to split bomber formations by virtue of a rate of climb that hoisted it to 19,700 feet in six minutes. At that altitude the He 162 cruised at 522 miles per hour. Twin-tailed, the plane was marked particularly by the radical



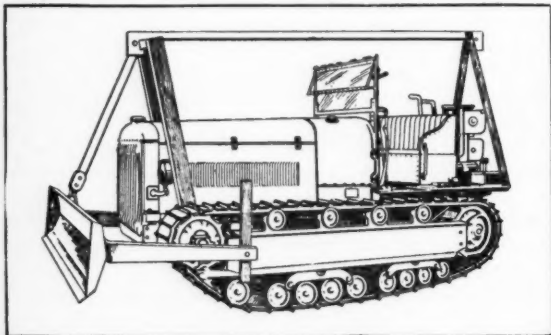
top-side mounting of the BMW 003 turbo-jet unit and an unusual fifty-five degree angular downturn of the wingtips. Flush, inclosed gear retraction was featured. The jet unit is rated at about 1,760 pounds of static sea-level thrust, corresponding to about 565 horsepower at 120 miles per hour or approximately 2,000 horsepower at 500 miles per hour. Details: span, 24 feet; length, 34 feet; wing area, 120 square feet; horizontal tail span, 8 feet 8 inches; gross weight, 5,940 pounds; service ceiling, 39,400 feet; sea-level high-speed, 490 miles per hour; range, maximum fuel economy, 242 miles.

(Aviation News)

JAPAN

Keninsha—2235, A Japanese Bulldozer:

Freely translated into English *Keninsha*—2235 is "movable tractor equipment number



2235." Actually it is the designation of a tractor with a cable-type bulldozer which was captured by American Marines on Saipan. To the best knowledge of this writer, it is the first Jap-made dozer to be seized in the war.

The tractor without the dozer is approximately 16 feet long by 8 feet high by 7½ feet wide. With the overhead cable mechanism the height is increased about a foot and a half. The blade adds from three to four feet onto the length, giving a total over-all length of about twenty feet.

The general appearance of the tractor reminds more of an airport tractor than of a bulldozer. The long hood absorbing over half the length of the machine creates this illusion; it houses the fuel tanks as well as the engine and its accessories. The fuel tanks, two in number, are directly behind the engine and are filled through pipes from the top of the hood. Beneath the tanks is the transmission. Small shutters on either side of the hood below the tanks permit inspections and adjustments.

The engine is a six-cylinder, water-cooled, gasoline type with overhead valves. Almost completely covering the fan are air deflectors.

One directs the flow of air onto the crankcase, which is ribbed for air cooling; another deflects air onto a large oil cooler on the left side of the engine; a third directs a current of air back onto the engine itself. The exhaust manifold is also ribbed for heat diffusion. The oil filler and dip stick are on the left side, while the generator is mounted on the right side of the crankcase. In general, the engine is of fairly modern design, comparable more with European types than American. It is certainly not very compact and probably not very efficient for the machine it powers.

(*The Military Engineer*)

Nicknames for U.S. Planes:

Nicknames were given by the Japanese to some U.S. airplanes. The Boeing B-29 Superfortress was called "Bee Ko," or "Plain Mister Bee," the Grumman F6F Hellcat was the "Kumanbachi" or bumblebee, and the Lockheed P-38 Lightning was the "Mazashi" or dried sardine.

(*The Aeroplane, Great Britain*)

Japanese Air Forces:

Approximately 4,000 Japanese aircraft were in front-line operation at the end of the war. Of the 600,000 personnel, about two-thirds were in the Army Air Force and one-third in the Naval Air Force. Air-crew skill, which was highest in 1941-2, had deteriorated markedly, and the majority of experienced pilots had been killed. Technically, the Japanese aircraft were of a high order, but usually suffered from some deficiencies not present in Allied airplanes. Aircraft production settled to an average rate of about 1,250-1,500 aircraft per month; losses in the air and on the ground accounted for all but 500 or so, per month. Relations between the Army and Naval Air Forces were far from amicable

towards the end of the war, the naval air crews being contemptuous of their army contemporaries.

(The Aeroplane, Great Britain)

NETHERLANDS

North Sea Mines:

Accidents and explosions at sea, resulting from ramming uncharted mines sown during the war in the North Sea, brought an order to Dutch shipowners to demagnetize their vessels. The Dutch government has instructed smaller shipowners to have their vessels treated at the naval installation at Amsterdam. Ships larger than 2,000 tons must be furnished with "degaussing" (demagnetizing) equipment, standard fitting for all newly constructed shipping.

(Netherlands News)

Canadians to Train Dutch:

A plan to train part of the new Netherlands Army with the help of Canadian officers and noncommissioned personnel is under discussion by the Netherlands and the Canadian governments.

The plan calls for the assignment of three hundred Canadian officers and nine hundred noncoms together with much Canadian military equipment.

(Netherlands News)

BRAZIL

Brazilian Paratroops:

Brazil is to have her corps of paratroops. The necessary studies are being conducted for the realization of this military measure, which, however, will be preceded by the training of the future instructors at Fort Benning in the United States. The idea is now in the

preparatory stage of opening voluntary enlistments in the corps, in order that as soon as the founding of the said school has been decreed its corps of students will be complete.

(Nação Armada, Brazil)

INDIA

India's Postwar Air Force:

The pre-war strength of the Royal Indian Air Force was one squadron only. The Force was steadily expanded during the war. The Government of India has now announced that it is its intention to maintain the Royal Indian Air Force at an initial strength of not less than ten squadrons plus the necessary training and other ancillary units required to provide a fully balanced force and to insure adequate scope for a career to the permanent personnel of all ranks.

This is only an initial minimum strength which will be expanded as rapidly as conditions permit and as personnel becomes available.

(Indian Information)

UNITED STATES

Liquid Oxygen:

Giant thermos flasks were used to carry vital oxygen over the "Hump" during the last year of the war, according to the Bureau of Ships. Thermos bottles of 150 gallons capacity were used to fly liquid oxygen which was then vaporized and placed in the standard cylinders for use.

In the China-Burma-India Theater a Navy unit manufactured and transported liquid oxygen over the "Hump" amounting to over 800 cylinders per month. In a period of seven months 2,000,000 pounds of air cargo was saved in this life line to China. This unit was the only naval activity in the area operated by naval personnel.

(Army and Navy Journal)

Water Heater:

The problem of heating water in field operations has been greatly simplified by development of the immersion-type water heater with which the Quartermaster Corps will replace the former style issued with the M-37 field range.

Selected for its simplicity of operation, it requires fewer replacements of parts and operates on any type of fuel—gasoline, light fuel oil, or kerosene. Through application of the immersion (operation under water) principle, the heating efficiency is increased and a 24-gallon can of water can be brought to a boil in about a half hour.

The heater consists of a burner, a water-tight combustion chamber, a stack eight feet four inches tall, and a fuel tank with a valve which allows the fuel to drip into the burner. It hooks onto and is set down inside the water container and may be lifted out for moving or emptying the container. It weighs slightly more than fifty pounds.

(The Quartermaster Review)

Eighth Air Force Statistics:

Nine thousand four hundred and thirty-eight enemy aircraft were destroyed by the fifteen fighter groups of the United States Eighth Air Force in Europe against the loss of 3,000 of its own machines.

Final statistics, completed at Command Headquarters in Great Britain, showed that 5,291 enemy aircraft had been destroyed in aerial combat, with the remainder accounted for in strafing attacks against airfields.

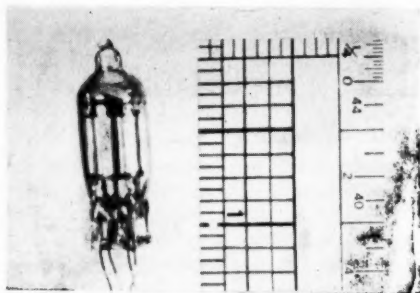
An additional 464 were listed as "probables" and 4,642 recorded as damaged.

(From a news report)

Proximity Fuze:

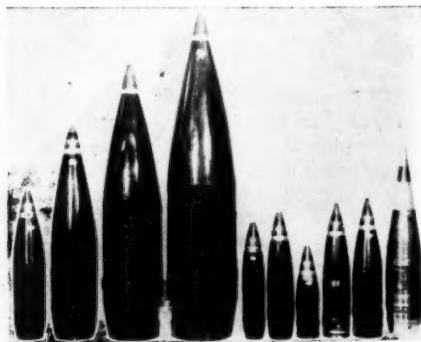
Another installment of the now-it-can-be-told serial, which includes the stories of the atomic bomb and radar, was the revelation by the Navy of a pint-sized fuze. It holds its own five-tube radio sending and receiving set and is credited with being a major factor in repulsing the German counteroffensive in

France in the winter of 1944, as well as with stemming the V-bomb attacks on London the preceding summer and the kamikaze threat in the last months of war in the Pacific. The



device, officially known as the Variable Time Fuze, explodes a projectile as soon as it comes close enough to a target to inflict damage.

Developed by the Office of Scientific Research and Development at the request of the Navy Bureau of Ordnance, the VT fuze, as it is commonly known, was credited by Admiral King with having "contributed greatly



toward winning the war for the United Nations."

The first photo shows the fuze; the second shows U.S. Army and British Army shells equipped with VT fuzes manufactured and supplied by the U.S. Navy.

(Official U.S. Navy Photos)

FOREIGN MILITARY DIGESTS

Tactical Diversion

Translated and digested at the Command and General Staff School from a Russian article by Lieutenant Colonel Mironov in "Krasnaia Zvezda" (Red Star) 21 September 1945.

THE troop preparations of the 2d Ukrainian Army Group for the Bratislav operations were carried out under complicated terrain conditions and during an unfavorable time of the year.

Our positions were situated in a great stretch of open area. The enemy was able to observe them to a depth of ten kilometers. The spring high waters prevented the fullest use of concealment from enemy observation. In the valley of the Gron River, and along its banks, fire and communication trenches were quickly inundated. The troops had to seek higher ground. A considerable part of the roads was also flooded and washed out.

The command, considering the general tactical situation as well as the terrain conditions, decided to direct its main effort against the center, in the Tekov-Zhelezovtsi sector. Secondary operations and demonstrations were planned to be carried out along the flanks.

In order to conceal the direction of the main and secondary efforts, the following plan of camouflage was undertaken: a feint attack on the left flank and simultaneous preparatory engineering work along the entire front. To carry out the projected plan, the command detailed the necessary forces and means. For the camouflaging operations during preparation for the attack, 2,500 men were employed five days and nights.

In concealing the direction of the main

attack, it was necessary, above all else, to camouflage the tactical regrouping of troops along the front. In order to achieve this, forces were concentrated secretly in the direction of the main effort and simulated concentrations of powerful forces were displayed at secondary points. The stream crossing, the concentration areas for crossing-equipment, etc., were hidden.

Tactical regrouping of troops was conducted at night. The shifting of troops was effected across the reverse slopes of heights and through woods and groves. Routes were chosen which would permit troop movement at night. Halts were made during daylight hours and, as a rule, in concealed places.

In the immediate proximity of the forward edge of, and on the approaches to, the positions (areas that could be seen by the enemy), all the roads were concealed by vertical drapes. Similarly, 122 kilometers of lateral and radial roads were camouflaged. Many of the camouflaged roads were within range of the enemy's rifle and machine-gun fire. Camouflage was done only at night, but the material was stored during the day in concealed places.

Inhabited localities, woods, and groves were selected for troop-concentration areas. Matériel was camouflaged with hay, brushwood, etc. Small units, tanks, and motor vehicles were placed in streams where they were not visible even to low-flying planes. In the troop-concentration areas rigid reg-

ulations concerning light discipline were enforced.

Artillery positions were concealed with drapes. Nets, set up before the arrival of the artillery, were garnished with twigs, dry grass, or hay. The surface areas of these drapes totaled 55,000 square meters.

In the sector of Garam, Keveshd, and Pald, one hundred dummy tanks were dispersed and sixty dummy artillery positions were constructed. There were five roving guns that followed a specific plan of operation to make the decoy artillery positions appear realistic.

The equipment for crossing streams usually was brought to the river at night and placed in spots hidden from enemy observation. There it was carefully concealed in bushes and buildings or camouflaged. The assembly areas for stream-crossing equipment were situated within a kilometer of the river. In the first phase of the preparation for crossing in force, the light stream-crossing equipment was carried to the areas by hand or in carts. The pontoons were brought up on motor vehicles which, immediately after unloading, were driven into places of concealment. Massing of carriers or troops in open areas and movement over unprescribed roads were forbidden.

In four places along the left bank of the Gron River, in the Binia-Keveshd-Garam sector, preparations for crossings in force were simulated. In these four places units carried out intensive ground and engineer reconnaissance. Here they built new roads and improved the existing ones; stream-crossing means were brought up and laid out on the ground. All this was done under a concealment of poor camouflaging. Sapper and other units simulating a preparation for a crossing in force were not aware of the fact that the units were executing deceptive operations.

In accordance with the plan, a series of demonstrations were performed along the flanks. Eight days before the general attack, a group began operating from the Bichka sector toward Komarno-Dier. This area was

of secondary importance. The troops advanced with the intention of diverting enemy forces. When they began their advance the enemy started to bring up some of his units, keeping, however, a considerable force opposing our center.

But on 21 March [1945], our units in the Garam-Keveshd sector began diversionary operations. They carried out several operations: attempting to cross the Gron River in force, in order to draw the enemy's forces to that area, find out his defensive system, and in conjunction with the previously mentioned troops, create the impression of an impending attack on Komarno. By this time, the deceptive areas of tank and artillery concentrations were set up in the Garam-Keveshd sector and in Pald. All of these demonstrations were successful. The enemy was driven from the right bank of the Gron River and our units consolidated themselves on the small bridgeheads.

The demonstrations in the Garam-Keveshd sector were especially successful, in view of the fact that our units crossed the river in that sector, broke through the hostile defenses, and approached Komarno. There they met a powerful line of enemy defenses and had to assume the defensive. The enemy rapidly concentrated large tank and motorized forces and was able to force our troops back to the left bank of the river. With deceptive operations, the crossing of the Gron River in the Garam-Keveshd area, and the simulated concentration of tanks and artillery in this area, the impression was created that our troops were renewing their attack. These operations, jointly with the attack in the Bichka sector, apparently convinced the enemy that our main thrust was being directed against Komarno.

The enemy pulled out large forces, those that were opposing our center and other sectors of the front. He held these forces in the Komarno sector up to the time of our advance in the direction of the main effort. In the meantime, taking advantage of the enemy's preoccupation with eliminating our bridgeheads on the Gron River

in the Garam-Keveshd area and with localizing our successes below Bichka, our troops were regrouped.

Our main attack in the center in the Tekov-Zhelezovtsi sector, which began on 25

March, caught the enemy by surprise. Having weakened his forces in that sector, he was not able to withstand our pressure. He was routed from the Gron River Line and began retreating to the west.

Artillery and the Hunting Spirit

Digested at the Command and General Staff School from an article by a Commander, Royal Artillery, in "The Journal of the Royal Artillery" (Great Britain) October 1945.

Artillery Training states that artillery is purely a supporting arm. I consider this cramping of initiative. To illustrate my meaning I propose to quote examples from the Arakan Campaign of 1944.

General Situation

The division arrived in Arakan in the spring of 1944. Our first role was to secure the Maungdaw base and the right flank of the 36th Division which was then fighting for the tunnels on the Maungdaw-Buthidaung Road. Later, as the main offensive died down on the approach of the monsoon, we secured the Maungdaw base and the Buthidaung Road across the spine. The area was immense, the troops few. Only key points could be held, the remainder of the country being covered by patrols.

Mastery of the Plain

On the right, between the foothills of the Mayu Range and the sea, complete mastery of the plain was achieved, mostly, at any rate during the early stages, by artillery. The only infantry which could be spared in a holding role in this area was a company of medium machine guns, which provided a pivot. Intelligence was obtained from local inhabitants.

Acting on this information the artillery did the killing. Never, for weeks on end, was the Jap given any respite. During daylight, air observation posts patrolled the area, linked with either 25-pounders or heavy antiaircraft (3.7-inch guns). Given a free hand and acting on either local information or on what they could see for themselves, they harried the Jap whenever they could.

And very cunning at the game they became, coming in from seaward at nought feet or down sun to surprise the Japs in the open.

After dark a program of carefully thought out and accurate harassing fire was kept up, reports of success or failure being given by local observers. In all this work intelligence officers of the Royal Artillery developed a keen hunting instinct and regarded themselves as "gillies" [attendants] to the guns.

In addition to the above, field regiments took a pride in "hunting" on their own. The object was to kill with guns. This involved sending forward into "no-man's-land-which-we-claimed-as-our-land" forward observation officers, which in turn entailed infantry escorts. In such enterprises the artillery was the primary arm, the infantry (and, on one or two occasions, tanks) the supporting arm. The gunner stated where he wanted to go to observe his killing; the infantryman escorted him there. The killing was done by sharp concentrations from as many guns as could be spared and brought to bear.

Results achieved in terms of "head of game shot" were difficult to estimate; but they showed themselves in Jap reaction. So annoyed was he at this constant harrying by guns that he threatened dire penalties on the local population (who were, so obviously, giving him away) and the clearing of the entire area. Our counter was to provide a mobile force of infantry and observation posts. This force by constant raiding and harrying retained control of this part of the coastal plan and protected the inhab-

itants. In the subsequent raiding, infantry and gunners played into each other's hands as a team. Sometimes the gunners supported infantry patrols or raiding parties; at others they became the primary arm (killing from afar), the observation post party being escorted by infantry.

Hunting in the Jungle

In the thick country the infantry was naturally the primary arm and the gunner was chiefly concerned with supporting his brother. Yet even here much "hunting on their own" was achieved by the artillery, infantry escorts taking forward observation officers to their chosen *machan*. (*Machan* is the Indian word for a "hide" from which to shoot game.)

Examples

1. A field regiment forward observation officer, whilst out supporting an infantry patrol, noted three newly-dug Jap bunkers and also the best place from which to observe a destructive shoot by 5.5-inch guns. It seemed a pity to destroy these bunkers without any Japs in them; better first to drive the "rabbits into the burrows, out of the gorse." This was achieved by 25-pounders and medium machine guns barraging back towards the bunkers. Quite a thin barrage did the trick. Meanwhile infantry had escorted the forward observation officer to his *machan* and there provided protection for him. The bunkers were duly destroyed and bodies were afterwards observed lying on the debris. Good hunting.

2. When the monsoon descended on us life became duly miserable for both sides. Miserable, that is, in so far that we were never dry. In such circumstances a welcome break in the rain clouds brought all "the rabbits out into the sun" to bask and dry their clothes. That gave us a chance for "killing from afar." All Jap positions had been carefully registered. When a break in the clouds occurred and the sun shone pleasantly on

any particular Jap position some observation post was bound to spot the fact. The news was flashed back and time given to the rabbits to come out of their burrows. A concentration did the rest. Not a very thrilling form of hunting perhaps, but it amused us and lowered the Jap morale.

I have quoted but few examples from among many similar incidents. I have tried to show that often on the battlefield the artillery may find itself the primary arm (as indeed I also noticed it was, in the desert in 1941).

Our ultimate object is the destruction of the enemy's forces. It is true that the final blow is given by the infantryman with the bayonet; but much hunting and killing is achieved by other arms before that final stroke.

The infantryman is a stalker and must needs close with his opponent in order to kill; the artilleryman is a "still hunter"—a "killer from afar." Both are hunters; only their technique differs. I urge that the hunting instinct be instilled into our artillery and the technique of "killing from afar" be studied, chiefly from a tactical point of view. For psychological reasons I urge the deletion of the words "purely a supporting arm" from our textbooks. It will be found that most opportunities for "killing from afar" occur when the battle stabilizes. During movement, artillery is too busy "supporting."

It may be argued that in its widest sense, the guns, by their action in the examples quoted above, were but carrying out their traditional role of "supporting arm." It might equally be argued that the bomber command was a supporting arm, in that its actions over a course of years but paved the way for the final "push of pike." However, I feel that the RAF was right in describing its efforts as an "air offensive." I would equally like the term "artillery offensive" introduced into our manuals.

Some Principles of Technical Training

Translated at the Command and General Staff School from a German article by Dietrich in "Vierteljahreshefte für Pioniere" No. 4, 1942.

THE very extensive employment of machines and motors in engineer equipment makes it necessary to place technically uninstructed soldiers in charge of the operation and care of these machines and equipment. To develop these soldiers into operators of engineer motor boats, or motor operators of other engineer equipment, requires an especially well planned course of instruction. Generally speaking, this training goes under the name of specialized training and is mostly entrusted to the subordinate commander. The quality of the training of these mechanics depends entirely on the knowledge and experience of the subordinate commander. The slight knowledge of their machines frequently possessed by operators, and the great lack of care and attention bestowed on the equipment entrusted to them, leads us to the conclusion that the knowledge of the subordinate commander is not as great as it should be for enabling him to instruct and train mechanics and motor operators.

Frequently the deficient education of the mechanics is only the result of laxness in training and insufficient preparation of the pupils by the instructor. Before every lesson, the instructor in technical subjects must prepare himself thoroughly and study carefully the pertinent sections of the service manuals or textbooks. One of his tasks will be to break down the subject to be studied in various topics, in the form of notes to be used in the class.

The method of instruction itself is also important. The following general organization, properly applied and varied according to the object, must form the basis of technical instruction:

1. Purpose of the object as a whole.
2. The principal parts of the object.
3. Description of the separate parts.
4. Interaction of the parts.

In short, this is the path that must be

followed in instruction involving machines; purpose, construction, and operation are distinctly separated. In instruction involving engines and motors the temptation to mix construction and operation is very great. One must watch carefully and not do this. Construction and operations are to be dealt with separately.

The instructor presents the subject in a systematized manner to the soldier, making use of visual objects (the engines or motors themselves, cut-away models, or instruction plates). As he does this he gives suitable explanations, asks questions, and in case of incorrect answers makes brief corrections. Yet in doing this, he must not permit himself to be led away from his predetermined plan.

In this manner the subject is presented to the soldiers, one point after another. In reviews of the subject the instructor takes a less prominent position. He asks brief questions which are to be answered by the soldiers in one or more short sentences. In these replies, special importance is to be attached to faultless posture; plain, clean enunciation; and curt soldierly expressions. By means of repeated review (drill), the soldier manages to appropriate the necessary expressions and give his answers without having to stop and reflect. By firm adherence to the intended form of presentation, wandering off the subject is avoided.

The instruction must be as free as possible from theory, and consist of practical instruction concerning the object itself. By bringing the equipment itself before the men, all need of theoretical support is avoided and the instruction is made objective. Plates illustrating the particular machine are especially valuable in showing interior operations, yet as a rule suitable plates are not available. Not every plate illustrating engineer equipment and motors should be called an instruction plate. Often it is only an enlarged and printed form of a blueprint. But it is foolish

to expect to use these in instructing soldiers, most of whom have had no previous technical training and are not only wholly unable to read a blueprint but perhaps never even saw one before. If one were to use such illustrations it would first be necessary to teach the soldiers the principles of mechanical drawing in order to render them capable of following the instructor in the illustrations.

Working these over into universally-understandable illustrations by omission of unessential parts and by the copious use of bright colors which serve not to indicate a material, but interrelated parts (for instance the crankshaft with the flywheel), as well as by the addition of words designating parts, constitutes the art of the preparation of plates for use in instruction concerning equipment and motors used by engineers.

When illustrations of this type, intelligible to the laity, are not to be had, it is better to get along without the use of illustrations altogether in technical instruction on engines and motors, especially in training mechanics and motor operators. In such a case it is better to confine the instruction to the motor or particular engineer equipment. Besides, the purpose is not to familiarize the pupils with every detail (every little screw, etc.) of a given piece of equipment or motor, but to give them instruction in operating and caring for the machines, so that they will be able to put them into operation, keep them going, and otherwise care for them. The mechanic and motor operator is expected to be able to recognize and remedy minor troubles himself.

This very thing, the recognition and remedying of troubles, is an important part of this training. It has no place at all in the classroom, but is purely practical. As a rule,

it is reserved for the ingenuity of the various battalions to find ways and means of imparting the proper instruction. Generally, it will be well to permit students to locate and repair troubles in the equipment assigned to the troops. Therefore, it should be so arranged that the same piece of equipment or motor is always used for this instruction, for the trouble must be brought about in the equipment either before or during the course of the instruction, and in the absence of the pupils. Parts of the machine are removed and replaced during the course of the instruction. All of this requires, after the termination of the instruction, examination by the Repair Service, of the equipment which has been used for training in order to guarantee its fitness for service.

In the case of the motors belonging to the largest of the engineer vehicles, instruction and detection and removal of troubles is made very difficult on account of lack of space around the motor. In these cases the ingenuity of the instructor will have to be employed to find ways and means of carrying out this instruction with the object itself. It requires a great deal of love for the work on the part of the instructor to be able to give technical training the same form as that of the rest of military instruction. Deficient scientific knowledge can, without any question, be remedied by industry and perseverance. It is the duty of the company and battalion commanders to conduct and supervise technical instruction in such a way that the usual impression that technical instruction is a stepchild of military training is removed from the mind of the instructor. By means of the proper cooperation of everyone, technical instruction will result in minimum damage to engineer motors and equipment.

A good officer is judged by his ability to obtain immediate results. A good soldier is judged by his discipline and training.

—*Revista Militar*, Bolivia

Antitank Defense in Offensive Operations

Translated and digested at the Command and General Staff School from a Russian article by Colonel N. Dmitriev in "Krasnaya Zvezda" (Red Star) 4 August 1945.

IN the campaigns of 1944 and 1945, the enemy did not employ armor *en masse*. His tanks and self-propelled guns were used primarily to support the counterattacks of his infantry against our forces wedging into his dispositions. This circumstance forced us to give a great deal of attention to the antitank defense of our advancing forces.

The counterattacking groups varied in strength from a company to two infantry regiments, depending on the importance of the objectives to be regained. This infantry, as a rule, was supported by from eight to thirty—rarely as many as fifty—tanks and self-propelled guns. Approximately a third of them were machines of the heavy type.

The enemy tanks and infantry were disposed in one or two echelons and attacked simultaneously from two or three directions, aiming their blows at points near the base of the attacker's salient. When using echeloned formation, the heavy tanks moved ahead or on the flanks of the infantry. The self-propelled guns were in the rear of the latter or on their flanks. When medium tanks were in the counterattacking group, these followed in the second echelon.

When in the field of fire of our antitank guns, the enemy tanks maneuvered along the front, taking advantage of terrain features, villages, etc., and endeavored to go around our antitank defenses. In doing so, the enemy attempted to stay beyond the direct-fire range of our antitank guns.

During the last months of the war, the Germans, in organizing their counterattacks, used the following methods. Three of their tanks would open fire at the same time on one of our antitank guns, or a group of them. In delivering this fire, one of the heavy tanks moved out a little ahead of the others and stationed itself sidewise or obliquely with respect to the target, while the other two remained back of it, making use of the first as a shield. During the period of rapid advance of our forces, the enemy tanks and self-

propelled guns, taking advantage of the peculiarities of the fighting along roads, often launched surprise attacks from ambushes. The latter were established in the outskirts of inhabited places, in the edge of woods, in forest lanes, and at the forks of roads, etc. In their efforts to obtain information of our antitank defenses, the Germans not infrequently sent out two "suicide tanks," which boldly approached our units in order to draw out our fire.

All the tactical tricks employed by the enemy were carefully studied during the course of the fighting. This was largely responsible for the development, on our part, of an invincible antitank defense. As a rule, it was organized as follows:

The first echelon of the defense consisted of battalion and regimental guns, and also guns of the divisional artillery, attached to serve as accompanying artillery. The division antitank battalions either formed a part of the accompanying artillery or followed its second echelon, playing the role of a mobile antitank reserve, ready to deploy in any desired direction. At times, this reserve was echeloned to the right or left rear, for protecting the threatened flank.

The mobile reserve of the division commander was the second echelon of the antitank defense. In the third echelon was a regiment of the tank-destroyer artillery brigade which constituted the antitank reserve of the corps commander. In the fourth was a regiment or a brigade (army reserve), and in the fifth echelon, two or three tank-destroyer brigades, which were at the disposal of army-group artillery commander.

The mission of the mobile antitank reserve was, generally speaking, to prevent the penetration of enemy tanks into the depth of our dispositions or into our rear areas. The method of action was aggressive: engaging the enemy or wearing down his forces for the purpose of stopping his further movement.

When a large artillery unit was assigned to

serve as mobile antitank reserve, its commander always reconnoitered the terrain lines to be occupied or the route of march over which it was necessary to move, and prepared a plan of action. This plan included the direction of movement, the anticipated direction of attack or counterattack by enemy tanks, the signals for displacing to other antitank defense lines, and the time required for reaching and occupying these lines. Overlays showing the anticipated maneuver accompanied the plan.

In making a correct decision, considerable importance attached to how and where the enemy's tanks were moving, the direction of their main attack, their strength and composition, and the presence in their formations of motorized and foot infantry.

The attachment to the tank-destroyer artillery brigade of the mobile antitank reserve of engineers for repairing roads and clearing mine fields proved quite justified. The adoption of this measure always accelerated the maneuver. The battle formation of the brigade consisted of one or two echelons. In the case of single-echelon formation, the brigade had a frontage of five or six kilometers and a depth of from two to three kilometers. When disposed in two echelons, the frontage was from two to three kilometers with a depth up to seven kilometers.

The heaviest antitank artillery was employed for increasing the depth of the antitank defense and for the reinforcement of the fire of the lighter guns, which were unable to penetrate the armor of heavy tanks.

Battle formation of the tank-destroyer artillery varied depending upon the situation. It was either semicircular with a radius

of from one to one and a half kilometers, or a horseshoe formation with its opening toward the enemy. This created, as it were, a pocket of fire. Caught in this pocket, the hostile tanks exposed their sides to the flanking fires of our guns. When the diamond formation was used, better coordination of fires as well as all-around defense was insured. The interval between platoons was between 300 and 400 meters; between the guns of the platoon, fifty to sixty meters; while adjoining batteries were located at a distance of no more than one kilometer from one another.

Whenever possible, the artillerymen made use of easily constructed antitank obstacles. Mining was used very widely. Men were posted a few hundred meters ahead of the position to give warning of the approaching tanks by means of rocket signals. At night they concealed themselves in camouflaged trenches and, on the appearance of the enemy tanks, lighted previously prepared fires—piles of hay, brushwood, etc.—to warn of the danger.

Antitank strongpoints were constructed in such a way that the combined fires of the artillery and of the heavy infantry weapons cut off the enemy infantry from their tanks. Special infantry covering forces were employed to protect isolated batteries from enemy infantry and submachine gunners.

The antitank defense organized in accordance with the foregoing plan proved, as tested in numerous battles, to be fully reliable. At times the enemy launched as many as twenty-five desperate counterattacks during the course of a single day, but not once was he able seriously to disturb our dispositions.

A powerful emotion must stimulate the great ability of a military leader, whether it be ambition as in Caesar, hatred of the enemy as in Hannibal, or the pride in the glorious defeat as in Frederick the Great.

—Carl von Clausewitz, quoted in *An Cosantóir*, Eire

A Study of Frustration in Relation to Army Life

Digested at the Command and General Staff School from an article by Captain J. A. C. Brown, Royal Army Medical Corps, in "Journal of the Royal Army Medical Corps" September 1945.

ARMY psychiatrists are often perplexed when they attempt to fit individual cases into the descriptions of the official nomenclature; for a large number of their patients are suffering not so much from neurotic illness as from neurotic behavior, in which the environment plays a much larger part than the endogenous factor.

Frustration may be somewhat artificially divided into the type induced during early training to enable the child to conform to the usages of civilized life, and the later thwarting incidental to human existence. The former is characterized by control of bowel, bladder, and sexual functions, and the elimination of inappropriate emotional responses. Its commands are finally accepted by the individual and become part of his moral beliefs (in Freudian terminology, they become introjected as the super-ego). The other type, on the contrary, is often felt by the individual to be irksome and unnecessary and is not willingly accepted by him. For instance, the frustration of the man who wishes to get married and cannot afford to, or the example of the employee who has to submit to the anger of his employer.

A state of war produces considerable modifications in the latter group; for there is a considerable number of people who for the first time, perhaps, find their energies appropriately directed and their work considered important to society. Restrictions may increase, but their purpose is usually evident and the blame can be placed on a common enemy rather than the State. On the other hand, for the soldier, new sources of frustration arise, the main ones being the conditions of army life and separation from home. In front line service the aggression produced can be directed against a visible enemy and, in any case, less frustration exists, because the reasons for restrictions are apparent. At the base, however, where the reasons are less evident and the opportunities for direct re-

lease of aggression do not exist, it is more liable to be directed along the lines of least resistance; against substitute objects or against the soldier himself. Paradoxically as it may seem, the base area soldier has, for this very reason, often a more difficult psychological problem to face than the man in the front line. Where there is no danger to share, the tendency is for group spirit to dissipate rather than increase, and the powerful help of morale is thus lost.

It is in this atmosphere that states of frustration (or, in ordinary language, demoralization) arise and may appear before the psychiatrist. They are not true neuroses or anxiety states for: (1) they show, in the pure form, no endopsychic conflict; (2) they show no true depression; (3) they can only be "treated" by altering the environment.

Although these states are due to frustration, it would be wrong to think that they are conditioned by that alone. The additional factors are numerous and may be divided into endogenous and exogenous. Taking the endogenous factors first, the impression is that intolerance to thwarting, though it may be due partly to an inherently inadequate constitution, is largely due to developmental causes. Many of the cases seen have been spoiled children who were "fussed over" in childhood and too readily got their own way. Such individuals naturally retain a dislike of not having their desires satisfied. On the other hand it is, in my opinion, quite incorrect to label all these cases as chronic or constitutional neurotics; many of them are, but a large number show no sign whatever of previous neurotic symptoms in the narrower sense of the word. In a series of 100 recorded cases, forty-six men considered that they had never previously been neurotic or nervous in the sense of having specific symptoms such as phobias, anxiety, sleep-walking, or bed-wetting. In other words, a large number show traits which are rather psychopathic

than neurotic, that is, traits which show in the sphere of social relations rather than in discomfort to the patient himself. Incidentally, in a psychiatric hospital, one is perhaps too prone to accept the fact of a neurotic constitution as being, in itself, an adequate explanation of a patient's breakdown in army life. Some of us who have been RMO's [Royal Medical Officers] cannot help feeling that this has become somewhat of a myth. Nobody would deny that there are certain inadequate people who are hardly able to stand up to any stress, however slight, but on the other hand few men would be found to be entirely free from neurotic symptoms. To assume that these are the main causes of neurotic breakdown in the army is unjustifiable. When the psychiatrist goes out and studies men in their units he finds large numbers with fairly severe symptoms who carry on with their work and never report sick at all. Not only that, but an appreciable number admit that they have improved or have even lost original symptoms while in the army. One of the neurotic's main needs, the need for certainty, and security in the group, is, indeed, found par excellence in the army.

Morale, too, is of fundamental importance. It may be defined as the feeling that others are fighting or tolerating difficulties along with oneself; that one's own weakness is capable of being controlled by the group of which one is a member. Strict discipline, if intelligently applied, is helpful, because it produces this feeling; slack discipline, on the other hand, throws the individual on his own resources. The existence of a psychiatrist, with knowledge and desire to help and give advice, is excellent, but the existence of a psychiatrist, thought of as someone who can send a worried man home, is not only not helpful but even unkind. To the worried but conscientious soldier it is like eating a sumptuous meal before a starving man. The attitude of some men with home worries, "If my application for compassionate posting is turned down, I can go to a psychiatrist and he will send me home," is bad for morale, for it puts undue strain on the man who tries to do his bit in the face of difficulties.

He is being tantalized. In addition, it creates in the man who is being sent home the impression that he is ill, which is not true. Thirdly, though of less importance, it leads the psychiatrist to give full diagnoses and use indiscriminately such terms as "psychopathic personality," "anxiety state," and "depression."

The existence of the possibility of escape is of immense importance. It has been said that the neurotic requires certainty. If he is told "You will stay three years in this station and that is that," he will not like it (who does?), but he will not be perplexed and he will submit to the inevitable.

Corresponding to the two types of response described by Burt as aggressive and inhibitive, we have two clinical types already labeled and recognized by the soldier under the titles of "bloody-minded" and "browned-off." The former is resentful, intolerant of discipline, and aggressive to his superiors in rank. Nothing done for him is satisfactory, and education schemes or entertainment are just "propaganda." When there has been some repression of aggressive feeling, the condition may develop into the psychiatrically more serious one where there are outbursts of rage over trivial causes, lack of sociability, and very commonly the man may get really alarmed by his internal tension producing a feeling of "something going to burst inside." This latter state, where insight into the true cause of his state is being lost, is obviously approaching the true neurosis. In the inhibitive or "browned-off" type, the well-known picture is produced of lack of interest, apathy, and sullenness. This type, again, if not taken in hand early, may develop into a more pathological state. The man becomes withdrawn, loses interest in his appearance, and sullenly repeats his request to be sent home. No discussion or argument makes the slightest impression when a man has regressed to this level.

It is of interest to note that primitive peoples may, by frustration of the above type, regress to almost incredible degrees, and appear to be actually psychotic. The Arab illiterate may be in a state of frenzy,

and apparently maniacal when thwarted, for instance, by being locked in a detention cell. When asked questions, he will give absurd answers or be completely mute. Many such cases were initially diagnosed as mania or schizophrenia, but removal from the thwarting environment results in almost immediate recovery. The same naturally applies to all states due to pure frustration.

The treatment and prophylaxis of the frustration syndrome has already been inferred in the discussion above. When the

state has proceeded for any length of time or has attained any depth, it is doubtful if anything can be done other than disposal through psychiatric channels. Unless they are in this hopeless stage when first seen, such cases should never be sent to a psychiatric hospital. The prophylaxis as suggested consists in attention to the man's personal worries, good unit education, facilities for sport and recreation, and firm but just unit discipline.

How to Keep Warm in Winter

Extracts from the Soviet "Handbook of the Guerrilla," Third Edition, 1942.

Protection of the Feet and Legs

PROTECT your feet from the cold. They are very susceptible to frostbite. Get your feet accustomed to cold by bathing them often in cold water. Before a march, be certain to wash your feet and cut the toenails.

Footwear should be large enough to allow you to put on some extra socks. It is advisable to put into the shoes some felt or straw sole-lining. You can make small fur caps (of squirrel-, goat-, or sheepskin) for your toes, which are most susceptible to frostbite. Wiggle your toes from time to time; this warms them up. Do not tie your shoe laces or ski-straps too tight.

Footwear should be dry. Damp shoes or socks frequently cause frostbite even in mild frosts. Before marching, it is best to apply to leather footwear some sort of oil or fat, such as fish oil or beef fat mixed with grease or castor oil. Then the leather will become moisture-proof. Do not dry footwear near a campfire or a very hot stove. The leather will then become too dry and brittle. If shoes or boots have to be dried rapidly, fill them up with warmed and dried oats, which will quickly absorb the moisture. You can also fill your shoes with dry hay. This, too, will accelerate drying. When wearing leather shoes or boots, it is best to put on a pair of cotton socks, which absorb the sweat, and

on top of them, one or two pairs of woolen socks. Place a piece of newspaper between the pairs of socks.

The footwear best suited for cold weather is felt boots and fur boots. If possible, make yourself a pair of fur boots. They should reach up to the groin and be tied to the belt. The fur surface should be on the outside.

Clothing

Clothing should not be tight-fitting. Dry it well before marching. Check all the buttons and fastenings. It is better to wear a few light garments than one heavy one. When you walk rapidly, take off your outer garments and tie them to your knapsack. When you arrive at a resting place, dress more warmly.

It is best to use mittens with two fingers: thumb and index. Thus, you will be able to shoot.

Wash socks, mittens, and underwear often, because dirty and sweaty clothing provides less protection against frost.

Prevention of Frostbite and Freezing

Before a march, rub in unsalted fat on those parts of your body which are most susceptible to frostbite, i.e., fingers, nose, ears, and chin. For this purpose, use lard, goose fat, or butter. Do not use vaseline.

Rub the fat into the skin, but leave a thin layer on the surface.

Make short halts frequently—after every half-hour of marching. If possible, try to have your halts in buildings. Having halted, do not lie down in the snow. It is better to sit down in a squatting position and against a tree or a haystack. Do not fall asleep during a halt.

Campfires

If you are sure that the enemy is far away, you may make a campfire; but make sure that it does not reveal your position. Learn how to make campfires quickly and how to make them invisible. If your fire is not hidden by shrubbery or trees, make an artificial screen.

When you have decided where to build your fire, remove all grass and bushes. (In summer, dig a small ditch around your campfire.) If the campfire is used for cooking, you should take into account the direction of the wind. In calm weather, hang your kettle directly over the fire. When it is windy, the kettle should be suspended, not over the flame, but in such a way that the wind will blow the flame toward it. The following are types of campfires which may be used (see sketches):

1. *Star Fire*.—Logs are placed radiating from the center and forming a star. If made of thick logs, it will give plenty of heat and burn a long time. As the logs burn, move them closer to the center.

2. *Polynesian Fire*.—The fire is laid in a shallow hole. Logs are placed upright. Such a campfire does not consume much wood, yet gives a good flame and accumulates embers.

3. *Hunter's Fire*.—This is made of three logs of any diameter or length, placed like a fan on two other logs. Start the fire where the logs come together. Move the logs forward as they burn away. Such fires burn slowly and produce plenty of heat.

4. *Night Fire*.—This is invisible even from a short distance. Take two logs and

cut grooves along their entire length. Fill the groove of one of the logs with hot embers. Place the second log, with its groove down, on top of the first one. The embers and logs will burn very slowly and flamelessly.

5. *Invisible Fire*.—Dig a deep hole, build a fire inside, and place a piece of tree bark to form a chimney, bending it so that one end is on the edge of the hole and the other on the ground. Smoke will follow it, and no flame will be visible.

Lighting a Fire Without Matches

You can light a fire in the following manner: Prepare some kindling from dry birch bark, paper, etc. Take the bullet out of a cartridge and pour some of the gunpowder onto the kindling. Stuff the cartridge, not too tightly, with paper. Hold the muzzle a little above the kindling, and fire. The shot will ignite the kindling.

Protective Shields and Huts

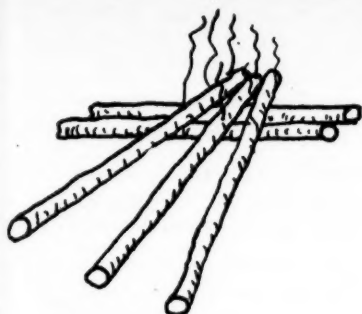
If you have no tents, use shields. A shield looks like a hedge. It is placed at an angle to the campfire and at a distance of three to four paces from it. The heat of the fire will be reflected from the shield and warm you. The shield also protects you from the wind. It is used during shorts halts and night bivouacs.

Shields are made of branches, brush, and twigs. It is best to construct such shields between two trees. When trees are not available, fasten the shield to poles previously tied together; or a shed may be made of shelter-halves tied to posts or ski-poles.

Have your bed slope slightly toward the fire. This will give you more warmth.

In constructing the shield, make sure that the wind does not blow the smoke toward you. It is best to have the wind blow along the shield. You can also place shields on both sides of the fire opposite each other.

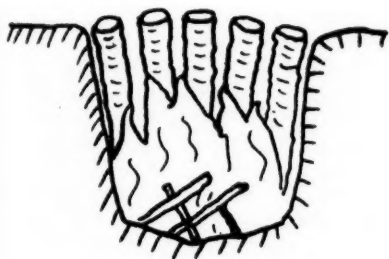
In a dense forest, you can build a simple hut made of brush. For this purpose, pile up earth in the shape of a horseshoe around the spot you have selected for your hut.



HUNTER'S FIRE



NIGHT FIRE



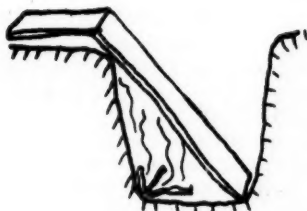
POLYNESIAN FIRE



KINDLING



STAR FIRE



INVISIBLE FIRE

Place three long poles over the earth and tie their tops together. Put branches over these poles at an angle so that their ends rest on the tied poles. Cover this framework with pine branches. This forms a hut. Build

a fire in front of it. When inside the hut, sleep with your feet toward the fire.

Before building a hut, determine the direction of the wind. The entrance to the hut should be on the lee side.

Advanced School of Air Warfare

Translated and digested at the Command and General Staff School from an article by Commander Jorge A. Peluffo in "Revista Militar" (Argentina) August 1945.

Creation

THE Advanced School of Air Warfare was created by Decree No. 16,501 of 23 June 1944. It is directly under the Commander in Chief of Aeronautics.

Since 29 July of this year, aviation captains are no longer required to pass an entrance examination to the Army's Superior School of War as a prerequisite for promotion to the rank of major. They must successfully complete an examination, however, in the Advanced School of Air Warfare in order to attain major's rank. On 2 April 1945, regular classes were started. Course I, with a total of thirteen students, is in progress at the present time.

Reasons for Creation

The Advanced School of Air Warfare was created in order to satisfy the need for professional training of a specialized type. As a matter of fact, until now, the Superior School of War has supplied aviation officers capable of performing staff and command functions and endowed with the necessary basic knowledge and moral aptitudes. This has required considerable effort on their part, as students, to prepare themselves to be future leaders of ground forces and to exercise commands which they would never assume after leaving the school. This is time which could have been used in furthering their knowledge of the specialized branch of aviation.

Owing to its own requirements, the Army's Superior School of War is obliged to direct its activities toward the study of ground warfare in the same way that the School of Naval

Warfare concentrates on naval operations and sea warfare. The time that had been devoted to the study of air warfare in the Army School was considered insufficient in the light of the lessons learned during the present conflict. It therefore became necessary to establish a center of specialized study in which air officers would receive instruction in the field of aeronautics.

Although the study of combined operations of the three armed forces was deemed important, the main emphasis in the advanced study of aeronautics must, however, center around the training of officers especially destined for higher command in the air force. These officers should be qualified to perform advisory functions on aeronautical staffs, with the technical knowledge essential to the highest efficiency. This is and must be interpreted as the fundamental purpose of the creation of the Advanced School of Air Warfare. In addition, and this point should be emphasized, the school also has the task of training ground officers of the air corps who are slated for the command of units and large ground installations, the efficient functioning of which is indispensable to the air units in the fulfilment of their mission.

Functions of the Institute

In addition to the specific functions the Advanced School of Air Warfare, it is charged with the fulfilment of certain statutory requirements. For example, it subjects all air corps officers to an annual obligatory examination with a view to subsequent promotions.

Character of the Institute and Organization of Instruction

Though the examination for entrance to the school is obligatory and required by law, enrollment in the same is optional and follows on request of the candidates, providing they possess certain educational and moral qualifications.

Paratroop officers may also enter the school in order to specialize in advanced studies relative to the conduct of ground operations.

In order to comply with its mission, the general plan of studies of the school comprises two phases made up of: Phase A, consisting of Courses I and II, each of a year's duration, and Phase B, consisting of Course III of one year's duration.

Each school year has a minimum duration of eight months, classes beginning as a rule around the 1st of March. Practical exercises in the field are usually held between 5 November and 5 December of each year.

When Phase A has been finished, the student aviation officers go back to air units in

order to obtain experience in the duties of commanders of subordinate units and advisers on staffs of large units. They may also act as assistants to air attachés and be detailed for special study in foreign countries.

Those air commanders who have completed Phase A, providing they possess the qualifications required by the regulations of the school, are enrolled in Phase B (Course III) at the beginning of the third year.

Conditions Governing Graduation

When Phase A has been satisfactorily completed, the officers obtain a "Certificate of Graduation from the Advanced School of Air Warfare." Upon the completion of Phase B, these officers obtain the "Diploma of the Advanced School of Air Warfare" or the "Aeronautics Staff Diploma," in accordance with their particular aptitudes. Both the "Diploma of the Advanced School of Air Warfare" and the "Aeronautics Staff Diploma" generally authorize the exercise of higher commands and staff positions.

Peacetime Use of Mine Detectors

Australians have found a peacetime use for mine detectors. Australian engineers in the battle-torn Wewak sector of northern New Guinea have turned to repairing the numerous wrecked bridges that cross the coastal streams. A great hardwood forest reaches skyward from hundreds of square miles of the ground that was formerly their battlefield. They knew that the Japanese had been cutting timber, but there was no trace of their sawmill. Mine detectors found where the Japanese mill machinery had been buried. And, when the mill had been set up and the saws were whirring again, the mine detector was more than useful in discovering cannon slugs, and bullets which would have played havoc with the saws and planers.—*Australian Information Bureau.*

Strategies — The Ties Which Bind Them

Translated and digested at the Command and General Staff School from a French article by Admiral R. Castex in "Revue des Questions de Défense Nationale" July 1945.

In time of war there is struggle everywhere. There is a constant political strife in diplomatic circles, struggle on the ground, on the water, and in the air, as well as financial and economic rivalries and fights for colonies. Then there is the moral struggle which supports all the rest.

There is no separation of these varied aspects of the conflict. There does not exist, partitioned and isolated, a diplomatic war, a ground war, a financial war, an air war, and a naval war. Briefly stated, there is just war, and each of the aforesaid hostilities is only a form of it, only a manifestation of it in a certain *milieu*. This is the principle of total warfare.

Each of these forms of warfare has its requirements, its methods, a distinct way in which it is conducted—in short, its strategy. There is therefore a political, a ground, a naval, a financial, an economic, and a moral strategy. There are, thus, several forms of strategy.

Let us examine ground strategy. Its case is extremely interesting, because of its importance and preponderance and the fact that its field of action, limited as it is by nature, does not allow its subordination. This is true to such an extent that its directing brains formerly harbored the illusion that they existed only to fulfill their familiar motto: "Everything for the battle; the rest does not matter."

In practice, this has been somewhat modified. The war of 1939-1945 has once more called this to our attention. It has shown us to what an extent ground strategy was influenced, as has always been the case in the course of history, by considerations bearing on naval warfare. This has been the case to a greater extent than ever before, because this time major ground and sea operations have occurred around and on seas, which, if not exactly small, were at least of limited extent, such as the Mediterranean, the Baltic,

the North Sea, and the English Channel. The area of these ground and naval operations was greatly increased as a result of technical advances and new weapons, which extended offshore the line of demarcation between ground and naval forces, previously constituted by the coast line. The result of this was that: (1) in such areas, to a greater degree than formerly, mastery of the shores became an almost necessary condition in order to dominate the basin; (2) it was necessary to control the coast if one wished to have possession of the water; (3) the battle for the seas was accompanied by the battle for the land area; (4) maritime domination was complicated by the problems of controlling the land areas; and (5) in the final analysis, ground strategy had to be considered in the conduct of naval warfare. Thus, ground and naval combat became interdependent.

The naval situation of the Allies in the Mediterranean was far from favorable in 1941 and 1942, at which time they were confined to the eastern Mediterranean as a result of the enemy advance in the Balkans, in the islands, and in Cyrenaica. The situation, however, changed completely in 1942 and 1943 as a result of the favorable ground operations which carried the British forces from El Alamein to Tunis, and also because of the Anglo-American landings in North Africa, Sicily, Sardinia, and southern Italy. These latter, particularly, brought about a remarkable re-establishment of the Allied naval position in the eastern Mediterranean. Consequently, there is no doubt that dependence upon naval forces strongly influenced the conception and undertaking of these operations by the ground forces.

The problem of the attack and defense by land of the Suez Canal, in this same period of 1941-1942, must likewise be regarded from this angle. If the attacking enemy succeeded in gaining possession of the Canal, the whole

of the Allied maritime structure in the eastern Mediterranean would collapse, and the British would have to abandon the area. Conversely, if the defense succeeded, the British position in the Mediterranean would be safe. Ground operations depended upon the navy, or as we might express it, the sea arm had a great influence on the ground strategy.

We can also cite, in this category of ideas, the still more appropriate case of naval dispositions which neutralize straits, channels, arms of the sea, etc. The ability to do this often depends a great degree on ground operations. Hence, for ground strategy of both kinds—offensive and defensive—dependence upon the navy is unavoidable. As proof of this, attention is called to what occurred in the case of the Anglo-French dispositions in the Dover Straits. During the course of their victorious advance in August 1914, the Germans had totally neglected the additional and considerable advantage of occupying, at little cost, the ports along the Straits of Dover. In 1918, Ludendorff, anxious to avoid the repetition of this error, accepted the aid of the navy and, in the planning of his March offensive, he provided for rolling up the left wing of the Allies and seizing the ports. The plan almost succeeded with the offensive of April 1918.

In May 1940 the Germans came back to the Ludendorff concept. After the Ardennes breakthrough, they drove not toward the southwest, but in the direction of Boulogne and Calais, maintaining only security of their left flank during the drive. This brought about the collapse of the naval positions in the region and acquired an excellent springboard for their attack to the west. Naval considerations had affected ground strategy once more.

Similarly, the German offensive across France in June 1940 was characterized by a march to the sea. Germany for a long time had complained of being "stified" at the bottom of the North Sea cul-de-sac. Both to satisfy her thirst for world domination and to pursue her plans against England, she had to have access to the sea, i.e., to the

French side of the English Channel and to the Atlantic coast, which would provide her with bases and geographic facilities. Hence, at the same time Germany pursued her plans for the elimination of the French forces, her ground strategy dictated that she accede to the requirements of maritime strategy and push on toward the west. Viewed in this light, the entry of the Germans into Brest in June 1940 is seen in its true significance. It was something like the arrival of the Russians of the seventeenth century at the Pacific, and of the Cossacks continuing the Yarmak drive. Unconsciously, the soldiers of the German armored forces on feeling the treads of their tanks cut into the sands of the Armorica beach, must again, for different reasons, have uttered the cry of Xenophon's Greeks: "*Thalassa!*"

All this savored of servitude to maritime considerations. And "servitude" is the correct word. This was quite evident in 1944 when the Germans believed themselves obliged, in order to continue the occupation of the French coasts, to maintain a certain number of units there which, with their communications partially or wholly cut, were inescapably doomed to capitulation or destruction.

In the Allied camp, we saw the Americans, after their breakthrough of the German front at Avranches, late in July of 1944, fan out in a number of divergent directions toward Brest, Lorient, Saint Nazaire, Angers, the Loire, etc. This was done to secure and protect the rear and flank of the main attack aimed at enveloping the German left wing in Normandy, which was maneuvering at the same time along the line Laval-Le Mans-Alençon-Argentan. But maritime obligations were involved, as well as the necessity of driving the enemy out of the most important points he occupied along the coast. Better advised than the Germans of August 1914, the Americans did not lose sight of this side of the question; and, in our opinion, their ground strategy had in this respect the great merit of satisfying the desiderata of the maritime strategy without neglecting its own essential objective: the liquidation of the

enemy ground forces and of keeping everything on the move.

Ground strategy is also influenced by political strategy. The latter intervenes—frequently, as a matter of fact—for the purpose of directing military strategy into certain channels. It is true that this influence is not always judicious, it may be good or bad. It sometimes has a tendency to step over into domains where it does not belong. But it is impossible to assume an attitude of contempt toward its ends, which are often quite justifiable.

Thus, it is certain that the German occupation is very extensive regions in France, the Netherlands, Denmark, Italy, the Balkans, etc., terminated in 1944 in a situation that was very grave for the Germans, and which undoubtedly hastened their loss of these territories. There resulted from it the immobilization, essentially a pure loss, of considerable forces which were of necessity absent from the places where the decisive clashes occurred. But was not the continuation of the occupation in question motivated by reasons of prestige, that is to say, in the final analysis, by a political motive? In which case, ground strategy permitted itself to be placed in a dangerous position by yielding too easily to the pleadings of political strategy which, in this case, was interfering to an excessive extent in the former's domain.

It is likewise almost superfluous to state that ground strategy also is greatly dependent on economics, particularly, the obligation of conducting operations so as to acquire or preserve certain regions because of their agricultural, industrial, mining resources, etc. The war of 1914-1918 clearly demonstrated this and the war of 1939-1945 proved it once again. The German offensive of 1942 was directed only toward the southern part of the Russian front, because it aimed at the conquest of the agricultural lands of the Ukraine, the mines and industries of the Donets basin, and the petroleum of the Caucasus—in short, the resumption of the Ludendorff plan of "alimentary strategy" of 1918. Likewise, the Russian counteroffensive of 1943 was oriented

in this direction, having as its aim, and for identical reasons, the liberation of these same regions. German resistance stiffened when, with her back to the Carpathians, Rumanian and Galician oil was at stake. She also suffered a set-back in Hungary in October of 1944, since the bauxite and aluminum that this country provided was at stake.

We have mentioned some of the conditions which resulted in 1944 from German ground strategy of occupying vast European areas that required maintaining an excessively extended front. But was not this occupation, maintained despite all reason, also partially dictated by economics, that is, the desire to exploit to the maximum, the varied resources found in these areas? Viewed in this light, political and economic strategies joined efforts to induce ground strategy to commit a grievous mistake.

Analogously, did we not see large German units, during the course of the retreat from the Ukraine (1943-1944), linger in the Dnieper bend in a most dangerous situation, their communications half severed because they were holding desperately onto the iron of Krivoi-Rog and the manganese of Nikopol? Another example was the continuation of the occupation of Norway up to 1945, perhaps owing to the desire to maintain naval bases in that region, although such bases undoubtedly would become precarious once the German-held coasts became untenable as a result of the advancing Allied armies.

Before the present conflict a phenomenon of the same sort had been discernible in the case of Japan. The Japanese Army and Navy had not agreed with respect to the direction that should be assigned to their expanding operations. The ground strategy preferred the north: northern China, Manchukuo, eastern Siberia, etc., on the grounds of tradition, and because of a leaning toward the old direction of 1894 and 1904, that of their ancestor Hidayoshi and of the modern Oyama. Maritime strategy, on the contrary, was for the south, for the Indian archipelago, Malasia, even Burma, in order to acquire bases there and reinforce the Japanese naval power.

Economic strategy decided the case and gave the verdict to maritime strategy, because it saw in an expansion toward the south a means for acquiring the immense riches of this fabulous El Dorado of basic materials and supplies of every sort: oil, rubber, tin, rice, sugar, tea, coffee, and tobacco, etc. So ground strategy had to give way to the vehement pressure of economic strategy.

Maritime strategy, which by its very nature, possesses ties with a number of other factors, is naturally much more affected by the various other strategies than is ground strategy. The war of 1939-1945 is another illustration of this truth.

Allied maritime strategy, for example, was employed entirely in the interest of ground strategy when it supported offensive operations, i.e., landing of ground forces in Norway, North Africa, Sicily, Italy, Normandy, etc.; and it may be said that the activity peculiar to the maritime strategy was dominated over long periods by the needs of ground strategy, just as it had been previously in the case of the Dardanelles, Salonica, and Palestine expeditions.

Maritime strategy went to the aid of air strategy, particularly in the protection it gave the Allied carriers during the hostilities in the Pacific.

Maritime strategy was also affected by political considerations. Regarded from the positive point of view, the latter constrained the naval forces to engage in certain operations based on the political influence they would exert. Regarded from the negative point of view, that of juridical considerations (blockades, contraband of war, right of search, etc.), political considerations curtailed its activity somewhat.

Maritime strategy was likewise governed to a large extent by the requirements of economic and financial strategy, which as usual were presented to it in the form of the attack and defense of lines of sea communication. The economic requirements of restricting enemy imports, maintaining friendly imports, and the effort made to obtain victory

in the famous "Battle of the Atlantic" are particularly eloquent.

Lastly, maritime strategy was obliged to take account of the moral factors in the conflict, especially everything that had to do with submarine warfare, which at times stirred up feelings of excessive violence in the public opinion of both sides. The moral factor caused its voice to be heard. It was in short a renewal of the old lesson taught us by the war of 1914-1918.

Air strategy was really affected by political factors. It felt, to an unimaginable extent, the pressure of ground and maritime strategy, in the sense that it was inescapably drawn into both ground and naval fields of battle where it played an outstanding part. In ground operations it occupied this place not only at the front but also in the rear areas. On the seas there was not merely naval action but also attack of hostile, and defense of friendly bases and lines of communication.

Air strategy occupied itself, at the injunction of economic strategy, with the combining and executing of attacks on hostile industrial and mining areas, as well as with warding off similar undertakings on the part of the enemy. It did not cease for a single instant to act in this sense and during long periods this task, stemming from economic strategy, took up all its time.

In addition to this, air strategy was well-tested by moral factors. It was asked to save the countries at war from the inevitable bombing attacks and all the distress that accompanied them. It was mobilized without any delay whatsoever to return blow for blow and to "get the jump" on the enemy if possible, especially at those times when it was believed that such actions would result in psychological advantages. It was always forced to orient its activities in this direction.

In short, air strategy was never able to work untrammelled toward the achievement of its own objectives. It devoted itself ceaselessly to operations in the interest of the other strategies.

Political strategy itself is not exempt from obligations. One would believe that this ever-

present factor, so encumbering and obtrusive at times, is free from all such bondages. But this is by no means the case. The three military strategies (ground, sea, and air) have in many cases demanded of political strategy certain definite actions and a well-defined orientation designed to further their own military ends—which after all are natural demands, since the military strategies, because of their close connection with the outcome of the war itself, cannot be neglected. As an example, observe the line of action followed toward Japan. It is possible, and even probable—for otherwise they would have failed in their duty—that the Allied military strategists, as early as 1937 or 1938, realized the importance of not breaking immediately with Tokyo so as to be able to deal with one question at a time: first with the disturbance in Europe, then with the disturbance in Asia.

On other occasions political strategy has placed itself at the service of economic strategy, in order to assist the latter in achieving its aims in foreign countries, in hindering those of the enemy, in assisting in blockades, and in helping quiet and mitigate the inevitable protests of neutrals. Political strategy has even been subject to the influence of colonial strategy, in cases where the latter was powerless to protect the distant possessions of a nation and where this protection could not be realized except through skilful diplomacy.

The object of moral strategy is to dispose favorably the opinion of friends, enemies, and neutrals toward a nation's interests. For this purpose it employs propaganda measures through the press and radio, at home as well as abroad. Often the moral strategy is the object of demands and not that which demands. Very frequently the other strategies attempt to exact from moral strategy certain decisions; measures, or dispositions designed to permit the attainment of political, military, and economic objectives, by shaping the minds of those within the borders of a nation and those without.

There is an interplay of factors which exists among the several strategies. Let us

examine air bombings. In this case, demands are made on air strategy by one of the two other military strategies or by economic strategy, which presupposes—often to an exaggerated and excessive extent—formidable results. Unfortunately, such results are accompanied by certain unfavorable features. One cannot bomb here and there just as one wishes. For, if this were done, the danger would arise of provoking very disastrous moral and political reactions. One runs the risk of wiping out in an hour's time the results of several years of propaganda effort. One incurs the risk of reinforcing, on the side of the enemy, the position of an antagonistic government, causing it to alter its opinion, bringing it and its home front closer together, and consolidating its national unity. Worse still, if several nations are affected by air bombing, there is the risk of drawing those nations together, a movement aiming at solidarity which is undeniably unfavorable and whose consequences may be extremely serious. In such a case, both political and moral strategy, join hands and disapprove loudly of the action of air strategy.

Another example: Nation "A" is at war with Nation "B." One day the moral strategy of "A" conceives the idea of restoring to "B" its prisoners of war, considering that this measure might occasion magnificent reactions full of promises for the future. "A's" political strategy, when informed of this, acquiesces enthusiastically. Yet the idea has hardly been made known when economic strategy raises loud cries of protest. To do this would be to take away half its manpower and in such a case it could not assume the responsibility of manufacturing war supplies. The three military strategies add their protests to those of economic strategy. They have no desire to reinforce the military power of the enemy. We see the violent clash of these contradictory tendencies and it is up to the government to decide what course to follow.

Another example. In the matter of blockades, contraband of war, right of search, capture of enemy or neutral vessels, etc., maritime strategy is goaded on by both economic and financial strategy which cry: "Kill and

crush!" But political strategy which, much less excitable, perceives clearly the eventual and grave consequences of such a mode of action, exercises a moderating influence on this same maritime strategy. What is maritime strategy to do, confronted as it is by these two conflicting demands? Consider the matter of American cotton and rubber in 1915 and the problem of the Allied blockade at the end of 1939 and at the beginning of 1940. These were worthless from an economic viewpoint and filled with political difficulties from the viewpoint of neutrals.

Or, we may imagine a conflict in which a still greater number of participants are engaged, as witness what happened in Germany in 1917 with regard to unrestricted submarine warfare. It was economic strategy that had conceived the idea, anticipating wonders and miracles as regarded the bringing of England to her knees. Financial strategy was of the same opinion (the suppression of enemy exportations). Ground strategy, which as a matter of fact controlled naval affairs, subscribed fully to it, especially after

the arrival of Hindenburg and Ludendorff at General Headquarters. Moral strategy was of the same opinion, seeing in this course a means of revivifying German morale. Only political strategy and its representative, Bethmann-Hollweg, with a presentiment of the deplorable consequences to be expected from this new move, opposed it. We are aware of how, at the famous council of war of Pless (9 January 1917) political strategy was set aside by other strategic considerations and how the irreparable mistake of forcing the United States into the war was committed.

Such is the picture, greatly abridged, however, of the ties which bind the various strategies, their relationships, and the ways in which they interfere with one another. The picture is rather incomplete. We should add to it, as a matter of fact, what occurs in time of peace. For there exists, indeed, for each type of strategy "a peace-time consideration" consisting of all the measures appropriate to preparation for war, and the frictions and conflicts between strategies begin here.

Artillery in Street Fighting

Translated and digested at the Command and General Staff School from a Russian article by Major G. Menshikov in "Krasnaia Zvezda" (Red Star) 16 May 1945.

ONE of the distinguishing features of street fighting in large towns and cities consists in the fact that the main part of the artillery employed is used in direct firing. For instance, in the battle for Berlin, around eighty per cent of all the batteries at the disposal of the infantry units conducted their fire, as a rule, from open positions.

This methods of employing the artillery is dictated by the characteristics of street fighting. In the complex labyrinth of streets and alleys of European cities it is difficult to determine the line of contact between the fighting forces. The enemy is separated from one's own forces in the majority of cases by no more than the width of a street, at times only by the interior walls of buildings or the floors between the upper and the lower

stories. It is obvious that, under such condition, it is impossible to conduct fire from concealed positions.

Direct fires increase to a marked degree the ability of the infantry to advance. On account of the very nature of the battle, it is the artillery that crushes and the infantry that seizes the objective.

In the defense of inhabited places the enemy relies on solid stone buildings. Our infantry is literally forced to fight for every building. The success of the attack depends on how well-prepared the assault operations have been from the point of view of the artillery, that is, how completely the enemy's fire means have been suppressed.

One important circumstance should be emphasized: An attack in a large inhabited

place will not be successful in the absence of fire superiority over the enemy. The infantry is not in a condition, without the help of the artillery, to gain the upper hand; its weapons are not possessed of sufficient destructive power. For this reason, when the street fighting begins, most of the artillery weapons should be turned over to the infantry units as reinforcement.

The subordination of the artillery pieces to the commanders of companies and battalions does not denote complete decentralization of control. It is not permissible to disrupt the entire artillery organization. It is extremely necessary to leave a certain number of guns, preferably of heavy and extra-heavy calibers, to engage in independent firing. These guns should be under the division artillery commander as a fire reserve to be used in support of the operation as a whole.

The fire reserve is used mainly to counteract the enemy's artillery and mortars. In addition to this, the concentrated fire of this group of batteries may be used for action against especially powerful enemy strongpoints. These batteries may also be assigned supplementary missions: interdiction fires and the destruction of supply installations and command posts.

Another peculiarity of the combat activities of artillery in towns and cities is the difficulties relative to the controlling of fire, not only of large masses of artillery but also of the direct support artillery of the infantry. Due to limited observation of the field of fire within a city, it is difficult to select a firing position for a battery or even a platoon. Therefore, the artillery fire is controlled for the most part by the commanders of small units, and especially by the commanders of the individual guns. This circumstance does not minimize, of course, the role of the various staffs in the organization of reconnaissance during the course of the street fighting. The activities of the reconnaissance organizations will, however, be conducted mainly in the interests of the small units.

It is well known that in the fighting in the

streets of Berlin the enemy defended himself with exceptional stubbornness. He made an effort, to the full extent of his ability, to hold the positions he occupied. It is obvious that this called for calmness and objectivity on our part. Elaborate preparation preceded the taking of any proposed objective. The objectives were carefully studied, along with the approaches leading to them, the composition of their garrisons and their system of fire. After this, under cover of darkness, our guns were brought up in order to open point-blank fire with the break of dawn. Depending on the assigned mission, the fire was conducted either for the neutralization of the enemy forces or for the complete demolition of the buildings. The battle was terminated by an assault by the infantry and consolidation of the seized objective. The seizure of other strongpoints was prepared in a similar manner; each forward movement of our forces was preceded by an artillery preparation of the objective in the above-mentioned manner. Complete cooperation was thus secured between our artillery and infantry.

Combat in a large city, as has already been shown, is characterized by extreme complexity. In addition to the physical and moral strains involved, a high degree of combat skill is required of the participants. From the standpoint of the artillerymen, this means above everything else, the ability to find their targets quickly and destroy them in a single blow and to maneuver skilfully in the labyrinth of streets, alleys, and courts. Let us examine a typical example from the battle for Berlin.

A gun commander was assigned the mission of supporting an assault on a large building. To begin with, he studied in detail the targets on which he was to open fire and selected a firing position. The position selected (the ground floor of a corner building) answered every necessary requirement. It afforded protection for his gun and was provided with suitable approaches. A broad, low window insured sufficient traversing fire, and thick outside walls securely protected the crew and the gun itself from enemy action.

Having secretly taken up his position, the commander unexpectedly opened fire on the enemy. In a short while the artillerymen had fired twenty-two rounds, destroying five enemy machine guns. The unexpected and accurate fire produced a stunning effect on the enemy. The enemy soldiers that had escaped injury abandoned their posts in panic and concealed themselves in the basement, where the assault forces cornered them. The gun was moved, in the meantime, to another location, and at once prepared to lend support to the infantry in its assault on the next strongpoint.

Not infrequently, in cities, one runs into buildings with very thick walls and narrow, embrasure-like windows. Medium artillery guns are not very effective against them. In such cases, the assistance of larger calibers is hurriedly sought.

At the intersection of two Berlin streets stood an ancient brick building of small size, but with very strong walls. Numerous, narrow, embrasure-like windows enabled the enemy to fire from almost any position. When it became evident that the 76-mm and 122-mm guns were powerless to crush the weapon emplacements in the building, it was decided to call on the 152-mm guns. From a distance of four hundred meters, these guns destroyed the building and annihilated its garrison.

Frequently there were observed cases in which a building that was being defended by the enemy was literally riddled with holes by artillery projectiles; yet the garrison continued to defend it. This is explained by the fact that the enemy personnel took refuge in the basement during the time that the shelling was in progress. Since the basement was lower than the ground level, it was impossible to reach them with the fire of our guns. In such cases, in order to crush the enemy resistance, the building was destroyed down to its very foundations, obstructing the entrance to the basement and thus rendering it useless for future use. To demolish a building is not such a simple matter. Even point-blank fire from a single high-power gun,

could not complete this mission. Under such circumstances, the artillerymen fired at the same spot with several guns at the same time. After two or three salvos the walls and ceilings of a medium-sized building of three or four stories would collapse, ending further resistance on the part of the enemy.

In narrow streets lined with tall buildings, where it was not possible to bring up the guns on account of the proximity of the enemy and where buildings were to be destroyed, our forces made considerable use of rocket projectiles. The projectiles were brought up in their containers and placed in second and third stories, usually on a table opposite a window, and the containers were laid out in the direction of the building to be destroyed. The simultaneous firing of two or three projectiles brought about the collapse of the building.

The enemy acted quickly as soon as the building they occupied was set on fire. As a rule, setting a structure on fire forced the enemy to abandon the objective being defended. For this reason, it is necessary to make extensive use of incendiary artillery shells in street fighting.

The artillery engaged in indirect firing, as a rule, fires counterbattery fire. But this does not exclude its employment when massed fire is required for direct cooperation with the infantry, especially in preparations for attacking large enemy defensive positions.

Indirect fire should be preceded by careful preliminary preparation. Fire for adjustment must be conducted with extreme care. It is indispensable that the commanders obtain, with the help of the infantry commanders, a definite knowledge of the terrain and the dispositions of the infantry. In order to avoid firing on one's own forces, it is necessary to begin fire for adjustment by shooting over the target, gradually bringing the fire down on the target. This will prevent hitting anything that may be nearer than the target. Observation of every shot is necessary when firing for effect.

The Story of the British Pacific Fleet

Digested at the Command and General Staff School from an article by
A. J. McWhinnie in "Britain" (British Information Service) November 1945.

THE creation of the British Pacific Fleet was one of the greatest pieces of big-scale, bold planning ever undertaken by the Royal Navy. The war still raged in Europe; we still needed a strong Home Fleet. But in the Far East plans were ready by the beginning of December 1944.

On 11 December, it was announced that Britain already had two fleets available to fight the Japanese. The announcement said that the Eastern Fleet, operating from Ceylon, would in future be known as the East Indies Station under Admiral Sir A. J. Power, and a new British Pacific Fleet had been created to fight the Japanese alongside ships of America. The Commander in Chief of the British Pacific Fleet was to be Admiral Sir Bruce Fraser who, as Commander in Chief of the Home Fleet, had sunk the German battleship, *Scharnhorst*.

News came from Australia and New Zealand of the British battleship *Howe* being in those waters, the start of the new fleet; but there were no details of how big that fleet was—and how small. I can tell you now that there wasn't much besides the *Howe*! She was there showing the flag, the symbol of things to come. But while HMS *Howe* was showing the flag in the Pacific, the new East Indies Fleet was getting busy, and the headlines on 11 December 1944 showed how carriers of the East Indies Station were striking at Sumatra without opposition from the Japanese. By striking repeatedly at Sumatra we got the impression firmly established in Japanese minds that we planned non-stop strikes at Sumatra oilfield and airfield targets.

In January we sailed once again out of Trincomalee and Ceylon with the battleship *King George V* as flagship and with the carriers *Indomitable*, *Illustrious*, *Victorious*, and *Indefatigable*. You cannot very well hide the movement from port of ships like those, and everyone said "It's just another strike." But it was destined to be more than just another

strike. There was to be a series of strikes—strikes with a difference. Up on the bridge of the carrier *Indomitable* was the new AC-1, Admiral Commanding Carriers, the famous Admiral Vyan, Vyan of the Cossack, and he was organizing a cunning maneuver.

We steamed to Sumatra and struck hard and often at Japanese oil supplies off Palembang. After the first strike we steamed off, giving the impression that we were heading back to Ceylon. Then, after allowing sufficient time for us to get back to base, though in fact we were only killing time out at sea, we switched back on our course to return to Sumatra. After another series of successful strikes, the fleet again steamed across the skyline as though making for Ceylon. But, after veering a bit to the southwest, the ships wheeled round in a southeasterly direction. They were heading for Australia.

From that moment we ceased to be ships of the East Indies Station. We were the nucleus of the newly formed British Pacific Fleet. It was a bold decision. We left the East Indies Fleet temporarily denuded of some of its greatest strength. That was the reason for secrecy. We dared not let the Japanese know. We feared that if they knew they might stage some desperate suicidal attacks with their few remaining fighting ships on our Indian Ocean convoys.

So tight was the secrecy then and so careful were security measures that I had to give and undertake to make no reports in Australia for a fortnight. My dispatches from the Sumatra strikes, followed immediately by dispatches datelined Australia, would have told the Japs that the British warships had moved to the Pacific. I was even pledged not to communicate privately with London for that fortnight. Of course the men of the fleet were under orders, too, not to mention in their mail that they were in Australia until, ship by ship, they were announced as being there.

I left the fleet at Fremantle and flew on

ahead of the ships to Sydney to join Admiral Fraser's headquarters. There and at other Australian ports the forward planning staffs were busy night and day organizing at high speed. They needed to be, planning for big-scale war in the Pacific, with Sydney, the main base, 5,000 miles from Tokyo.

Then there was the question of supplies. We needed more than just battleships, carriers, cruisers, and destroyers; and we had no bases nearer than Sydney. But from a wooden two-story building at Albert Park, Melbourne, the White Ensign flew, and over the doors were the two words, "Royal Navy." This was the headquarters of V.A.Q., the admiral responsible for the supplies for the fleet. From that two-story building, officers and WRENS of the Royal Navy organized millions of gallons of oil and aviation spirit, planes, spare parts by the million, food supplies, tobacco and cigarettes, medical and general stores, and ammunition from ton weight shells for the battleships down to bullets for machine guns.

On strategic islands stretching from Australia to Okinawa, there were British naval liaison officers cementing operational cooperation between Melbourne, Sydney, and America. They were housed in little island huts, and were vital links in a chain which was ultimately to stretch to Tokyo Bay. Whatever the fleet needed when in operational waters had to be supplied from the Navy's floating market. That saw the birth of the fleet train. The fleet was to be supplied from especially equipped freighters, however far it was from land, and however long at sea.

Week by week more ships were coming out. Gradually Britain remedied the weakness in the East Indies Fleet. As the war in Europe was ending, ships were being hurriedly refitted for the tropics and sent out East. But Britain knew practically nothing of all that. The British people knew that ships were being prepared for the tropics, but there was no publicity, apart from the occasional unofficial comments from America that Britain, with all her resources and naval traditions, was not equipped to fight a big-scale war in the Pacific, thousands of miles from her

nearest base. It was said that, however well the Navy had done in the Atlantic and the European war theaters, this was a specialized type of warfare in which Britain could not participate satisfactorily, for the good reason, it was said, that she was tired and unready. Someone even called us the "British Pathetic Fleet"!

I remember that day at the beginning of March when I saw Admiral Fraser at Melbourne and referred to the comment from America that Britain could not put a self-sufficient fleet into frontline action in those waters. He is a very confident man, Admiral Fraser. He puffed at his pipe, and smiled. "Our fleet," he said, "is ready, eager and available for action."

It was on 30 March 1945 that the news came in that the British Pacific Fleet was in action for the first time, sixty miles east of Formosa. We were protecting the left flank of the American landings on Okinawa by preventing Japanese planes from reinforcing the Okinawa airfields from the west. The much discussed British fleet train was out there, too, steaming in nearby waters, keeping a constantly changing rendezvous with the operational fighting ships. And the fleet train did well. You could call on it for anything from radar equipment or new planes down to a box of phonograph needles. It was our floating chain store and it went with us wherever we went. We struck later at Formosa. The fleet train was around the corner ready to refuel and supply us with replenishments.

For the first time the Royal Navy was fighting under American orders. On board each British ship were American liaison officers and communications experts, initiating and assisting the British Navy men in the use of American signals, measures, and communications equipment, and they gave us a lot of praise for the speed with which the Royal Navy familiarized themselves with the American system.

The kamikaze squads, the suicide pilots, gave us our real testing time. If ever there was a job with no future in it, that was it! They crashed on the decks of the carriers, the *Victorious*, the *Formidable*, and the *Inde-*

fatigable, as well as on a destroyer. But only the destroyer had to retire. The carriers swept away the debris, put out the fires, cleared away the dead and wounded, and then brought up new planes from the hangars to go into action again.

Loud was the praise of the Americans. Gone were the old criticisms that we were not equipped or familiar with Pacific warfare. The B.P.F. had kept its promises and fulfilled its pledges. That was when Admiral Nimitz sent his message of thanks for the success with which the British Pacific Fleet was fighting the Japanese. As another American admiral said: "We lined up in the Pacific as friends in the first place and now we are partners."

But we had one terrific advantage. Our carriers may have taken a long time to build, but they have steel decks. Some of the hits by suicide bombers would have crippled us if we had had wooden decks. Remember what happened to some of the American carriers.

But there were bigger jobs ahead. The Royal Navy wanted a bigger job even than Formosa. Night after night, British commanding officers would go to the ship's microphone and tell their men, "I hope soon to be forcing on towards Tokyo."

One day the order came to move northward. We were going to Tokyo. We went. Battleships to bombard; carriers to fly off bombers and fighter bombers, together with their air

escorts; cruisers and destroyers to act as surface escorts. This was the big job. I went this time in the carrier *Victorious*. It was odd out there in the sweltering heat on our way up from Australia thinking, "We are going to Tokyo; yet only six months ago we were only starting to assemble a fleet out here."

The rest of it already has been written and told. The British Pacific Fleet sailed north all right, and with American forces closed in on Japan's mainland for the kill. Carrier planes and the guns of the big ships hammered at the enemy's coastal installations and whittled down still further the remnants of the Japanese merchant and naval strength. Then finally in triumph the fleet dropped anchor with American warships in Tokyo Bay. All this, remember, after six years of terrible war.

The race against time, the six months packed with action, had ended. A spectacular record had been achieved by this Empire armada of British naval men, Australians, New Zealanders, Canadians, and South Africans. Counting the ever-present fleet train ships, there were ultimately 200 ships and 100,000 men in the Fleet. They had come from the harsh waters of the Atlantic and the biting icy wastes of the Arctic and the Russian Run. Then in the swelter of the tropics they wrote another chapter in the glorious history of the Royal Navy, those men and ships of the British Pacific Fleet.

In the whole history of war there has not been seen any great undertaking so broad in conception, so grandiose in scale, and so masterly in execution as the large-scale forcing of the Channel and the mass landings in northern France.

—Marshal Stalin

Military Education in Brazil

Translated and digested at the Command and General Staff School from a Brazilian article by Lieutenant Colonel Correia Lima in "Nação Armada" October 1945.

THE present Minister of War, in his inaugural address, called attention to the necessity for examination of, and new orientations in, the courses of the General Staff and Technical Schools. Correlatively with this, the curricula of the School of Arms and that of the Military Academy, as well as those of the other educational establishments of the Army, will gradually undergo the revision demanded by the evolution which was brought about by the recent world war.

Military education in Brazil closely conformed to the orientation of the State with respect to political doctrines up to 1921, when the French Military Mission was engaged to map new courses for the Army.

During the Monarchy our courses of instruction included a multitude of philosophical, and even religious, subjects more suited to the education of doctors of law than to the formation of the indispensable fighting man's mentality. The ultra-cultural elite of the Army during the Monarchy was far more advanced from an educational viewpoint than the average officer.

The *bachareis* (those having a bachelor's degree) as the officers who have had the benefits of superior education were called, were eyed by the *tarimbas* (those without a degree) with that mixture of respect and envy that real superiority always arouses.

There existed shocking inequalities in the system of education. It scarcely gave anything more than a general and scientific education without any technical or professional objectivity to a small group of selected intellectuals or protégés of the State. The majority of the officers, the *gravata de couro* (leather neckties), did not receive adequate cultural education or professional training. They obtained their military education through the practical performance of their duties in the armed forces.

Discipline was strict from the standpoint

of hierarchic subordination. The service of the *tarimba*, the officer who had always served with troops, was performed with all the rigors of punctuality and bureaucratic exactitude. When there appeared in the units a *doutor* (officer who had taken the general staff course or that leading to the degree of bachelor of physical sciences and mathematics), he was shunned by his comrades who had come up from the ranks.

With the proclamation of the Republic the philosophers and sociologists, the positivists of the school of Benjamin Constant, became personages of real culture and extended their ideas on a mathematical and philosophical basis into the circles of the officer class. The positivists of the Army, much better philosophers and sociologists than soldiers, evidently occupied a very high cultural and moral level, though they could scarcely have possessed sufficient professional ability. They produced officers who were great mathematicians, sociologists, and political experts, men of culture of the highest order and worthy citizens to whom their country owes a great deal; but the Army which educated them benefited very little.

The officers themselves were not to blame for this. All the responsibility for their inefficiency as soldiers is to be laid at the door of the Army itself, which educated doctors and bachelors and failed to occupy itself with the truly military education of its cadets. Many of these soldiers, however good they might have been as officers, perhaps would not have achieved in the ranks the reputation they have today, which reputation has given a just cause for pride to the Army which educated them, as well as to their admiring officer colleagues.

Nevertheless, the main aim of military education is the training of officers, and not of scientists, bachelors, and doctors. Hence, the orientation of those times was erroneous. If all soldiers, or rather all offi-

cers, had been like Trompowski or Euclides de Cunha, they would have been helpless when the hour came to lead men through enemy fire. True soldiers at such times, would be revealed; unlettered men, backed by practical knowledge or intuition, would lead their men into battle better than those educated men with all their knowledge and theories. For this reason, the French military mission was convinced from the outset that it was imperative to impart a military trend to our officers' courses.

Careful revision resulted in a real house cleaning of the programs of the Military Academy and the General Staff School. The Officers' School of Arms (*Escola de Aperfeiçoamento*) was created with the aim of modernizing the tactical knowledge of company officers.

Subjects that could easily be dispensed with—geodesy, for example—were dropped from the curriculum of the General Staff Course. This school began to educate officers for general staff work instead of educating bachelors of physical and natural sciences and mathematics, as it had done before.

There developed then a condition of excessive ultra-professionalism. The general cultural level of our officer class dropped suddenly. At the same time there was an exaggerated lowering of admission requirements for entrance to the Military Academy and excessive simplification of the theoretical aspect of the courses given in our Army's educational establishments. There was now need for readjustment in the opposite direction. "Neither too much in the direction

of the sea nor too much in the direction of the land."

With the recent founding of the Technical School of the Army, which has proved itself of great value, the time seems to have come for a revision of the courses of our Military Academy and our Officers' School of Arms and General Staff as regards theoretical instruction in general courses, particularly in the case of the Military Academy.

It is obvious that a fairly vigorous entrance examination should be required, because a good foundation of secondary instruction is indispensable to the education of a well-trained officer. But with respect to superior education, it seems to us that it would be better for the Army to transfer that great quantity of theoretical, scientific luggage over into the curriculum of the Technical School, taking away from those schools whose task is to train tacticians, disciplinarians, and administrators subjects that are almost exclusively of interest to specialized technicians.

Reduce the study of internal and external ballistics to a minimum. Physics, calculus, mechanics, infinitesimal calculus, and a few other branches of higher mathematics (analytic geometry, etc.) would be subjects more for information and reference than for deep study. In the Technical School they should be rigorously taught in accordance with tactical necessities.

The moment appears an opportune one for remodeling the army from top to bottom and restoring its technical and professional efficiency.

The best soldier has in him, I think, a seasoning of devilry. Some years ago a friend of mine in a discussion on training defined the ideal infantryman as "athlete, marksman, stalker." I retorted that a better ideal would be "cat-burglar, gunman, poacher." My point was that the athlete, marksman, or stalker—whatever his skill—risks nothing; the cat-burglar, gunman, and poacher risk life, liberty, and limb, as the soldier has to do in war.

—Field Marshal Viscount Wavell, quoted in *Aim*, Great Britain

Contact in Swampy and Wooded Terrain

Translated and digested at the Command and General Staff School from a Russian article by Major E. Gorban in "Krasnaia Zvezda" (Red Star) 6 October 1945.

WOODED and swampy terrain is valuable for defense, but it makes the deployment for an advance difficult for all types of forces. When setting up defenses in wooded and swampy areas, the Germans first of all provided the utmost protection for advantageous approaches and important roads. They turned the villages within the woods into strongpoints. On high ground, in the center of wooded areas, the enemy dug trenches and foxholes. But in places where swamplands or underground streams interfered with the digging, the Germans built double-walled wooden fences, filling the space between the walls with earth. The platforms so formed between the walls were outfitted with machine guns and artillery pieces. These were capable of holding off infantry and also tank attacks. Moreover, the enemy made wise use of mines, mining forest roads, corduroy roads, fords, forest edges, and clearings. Road blocks were built also.

The enemy defenses in wooded and swampy areas were built in the form of centers of resistance and strongpoints. A rigid defense, with solid, fortified positions in critical approaches, was combined with delayed operations in secondary areas. This situation was taken into full consideration by the Soviet troops. The fact is that this type of defense gave our troops a great opportunity for maneuvering, which consisted of bypassing and enveloping the individual centers of enemy resistance and strongpoints. In every case, the operations and the formations of our troops were determined by the specific terrain conditions, the situation, and the objectives.

In the zone of advance of the Nth Infantry Division, operating as part of the 2d White Russian Army Group, a strongly-fortified center of German resistance was encountered on Cape Krinka. The approaches to Krinka from the east and the north were blocked by swamps, and from the south, by the narrow,

boggy Netupa River and forests. In order to prevent bypassing south of this center, the enemy set up zones of fire. From reconnaissance reports it was known that the Germans kept an infantry reserve with three or four armored units in the village of Studzianka.

The objective was to seize Cape Krinka. The Nth Infantry Division had a part of its forces feint an advance from the front [east]; while the main attack was delivered toward a sector south of Mal Ozerana, where a breakthrough in the enemy defenses was made.

Some of the units, exploiting their success, were drawn into the woods south of Podlipka. Here, three or four submachine-gun groups, each ranging from a section to a platoon in size, with two or three combat engineers attached to each group, were allotted to each infantry regiment. The groups, with the exception of the machine gunners, were armed with hand and antitank grenades. Their objective was to penetrate deep into the enemy defenses and attack small units and trains. The operations of numerous small submachine-gun groups immobilized enemy communications, disrupted his tactical control, and caused panic among his reserves, which were located in Studzianka. At the same time, the main forces of the division advanced successfully, having bypassed Cape Krinka from the southwest. All this compelled the enemy to abandon his strong center of resistance.

The engagements of some of our other units in the Shablistar-Nadbori sector occurred under different conditions. There the terrain is low, covered with shrubbery, groves, and many gullies. The enemy made use of old fortifications, and his defense consisted of an almost solid line. The small intervals between his strongpoints were protected by submachine guns and covered with mine fields. The attempts to operate under conditions, while using small groups, were not

successful. Instead, the advance had to be led, in several directions, by detachments of a reinforced infantry battalion. The attack commenced with a short preparation fire. Thereupon, the infantry, having drawn the attention of the enemy with its activities along the front, passed around the flanks to the rear of the strongpoints. In case of enemy counterattack, each battalion had a reserve of up to two infantry platoons and a few combat engineers.

Combat experience has shown that, when advancing through a wooded and a swampy terrain, reaching the objective largely depends on properly organized combat formations. For a breakthrough of a hostile defense located in an approach to a woods, the combat formations of infantry units (battalions and companies), while on a line of departure, or during an attack, should be assembled in a line. This proved to be the most expedient manner of making a frontal breakthrough of the enemy defense, seizing successfully the first and second line of trenches, and reaching the forest edges rapidly.

After a breakthrough of the main line of resistance and a seizure of approaches to the woods, the situation and the conditions of an offensive engagement changed greatly. During combat in the woods, our units encountered certain characteristics of hostile defense. Ambushes and road blocks that the Germans had set up, mined roads and clearings, threats of counterattacks into our flanks, infiltration of submachine gunners into our rear areas, booby traps—all these compelled us to adopt different tactics. When our infantry units infiltrated the woods the original line formation no longer satisfied combat requirements, for it made tactical control difficult and complicated. Also, a battalion in line formation could not maneuver easily in the woods, as a result of an excessive stretching out of the units along the front.

Combat experience in swampy and wooded terrain teaches us the following: As soon as the attacking force makes a breakthrough

of an enemy defense on an approach to a larger forest, and seizes the forest edge, the commander must tighten up his units. He lines up the platoons and the battalions in diamond formations, sends reconnaissance detachments forward, and sets up security patrols on the flanks and in the rear. The commander takes his place in the center of his unit and personally supervises its operations. All this simplifies control and allows the commander to direct the battle, not only by means of fire but by maneuvering as well.

Well-timed artillery fire played an important part in the support of infantry during an advance over wooded and swampy terrain. The features of the terrain and the absence of good roads required that a considerable part of the division artillery be assigned to infantry units. The infantry, moving up the forest roads, lanes, corduroy roads and through marshes, carried the guns by hand, thus allowing the artillery to keep up with the advance. During an attack on the main line of resistance and on strongpoints, as in the case of a battle in depth, a part of the division artillery was able to operate effectively by using direct fire. The remainder of the artillery accompanied the infantry attack, employing concentrations.

Artillery battery and battalion commanders who supported the infantry displayed great activity. Whenever the infantry encountered strong resistance and took cover from enemy fire, the guns which followed its battle formations moved forward and neutralized the enemy targets with direct fire.

Mutual support between the infantry and the artillery was usually attained through forward artillery observation posts equipped with radio sets. The artillery observers moved with the infantry battalions, and on locating the enemy they communicated the data to the batteries, which opened fire on the indicated targets. Mutual support was likewise accomplished by means of personal contact between the infantry and the artillery commanders. The best method of calling for artillery fire was through the use of predetermined rocket signals. Thus, the artillery

was able to follow the infantry movement forward and shift its fire accordingly. These signals proved to be especially effective in night operations when it was not possible to see the movement of forward units.

Woods are not everywhere accessible to tanks and assault guns. Rivers, streams, swamps, and lakes present still greater limitations to the employment of track-laying armored vehicles. For this reason, tanks and assault guns in such areas were normally used to reinforce individual units. They engaged hostile armored guns, which were operating from rear areas; accompanied infantry attacks, firing as they advanced; and helped to repel enemy counterattacks. Positive results permitted the mounting of infantry on tanks and assault guns advancing through woods.

In conclusion, certain general deductions may be drawn from an analysis of combat operations in woods. If an advance is made in a large, densely wooded area then the tactics should embody the use of independently-operating small submachine-gun groups, ranging in size from a section to a reinforced company with combat engineers attached. These groups, by infiltrating the enemy's rear area, attain their greatest efficiency

when we use a part of our forces to make a secondary frontal attack, while our main force executes a turning maneuver to attack the enemy's rear.

In terrain with patches of woods, and where there are hills, swampy depressions, and basins, combat is more expeditiously accomplished by individual units detached from larger units (with combat engineers and other reinforcements), ranging in size from reinforced company to battalion. Such individual units, conducting a thorough reconnaissance, determine the vulnerable spots in the enemy defense and launch a surprise attack. The attack must be supported by assault gun and artillery fire.

When combat takes place in sparsely-wooded terrain, combat formations should not be re-formed after penetrating the enemy's outer defense. Rather, the advance should be continued with the units in line formation. While advancing through a sparse woods a battalion should strive to reach the opposite edge of the woods as rapidly as possible, in order to prevent the enemy from consolidating the positions most convenient to him. In a situation like this, it is very important to have at least one small unit gain the enemy's flank and rear.

The Use of Positions, Shelters, and Camouflage in Winter

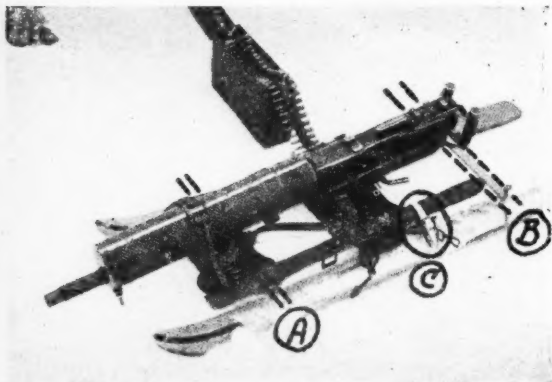
Translated and digested at the Command and General Staff School from an article in French by Captain R. Gallusser in "Revue Militaire Suisse" April 1945.

A snow-covered terrain slows down movement and renders the task of taking up a position very difficult for the infantry. The natural undulations of the terrain which afford precious shelter to the combatant during the warm seasons of the year are, in winter, deeply covered and made level by a white mass of snow. The soldier is obliged to make his way laboriously across great slopes where he seeks (sometimes in vain) a defiladed

position from which to fire his weapon. Every step requires extra effort, and he leaves a highly visible trail in the snow as he moves ahead. He is hampered when taking up his position, and the tripod or support of his weapon will begin to sink in the snow as soon as he opens fire. The gunner is in danger of being sighted by the enemy before he has a chance to open fire with his own weapon.

How is the soldier to adapt himself to these particular conditions?

With respect to the carbine the solution is relatively simple, for the marksman is able to assume the squatting or kneeling position and obtain proper support for his elbows against his body—unless he prefers to fire in a prone position with his rifle resting on his pack, which in turn rests on the skis he has previously removed.



Heavy machine gun mounted on pack frame, which is, in turn, mounted on the Swiss Army's new alpine skis.

We propose for the automatic rifle a solution which gave us good results. It consists in the permanent attachment of a ski-stick disc to each leg of the bipod. The automatic rifle, without any support, may be used instantaneously in meeting engagements and in assault fire, supported against the hip of a standing or kneeling automatic rifleman. In order to permit another type of firing which is advantageous from the point of view of getting into position rapidly, it is well to fasten the bipod to the middle of the barrel. In this case, the automatic rifleman concealed in the snow has only to push the automatic rifle forward, thus raising it, and he is in position to open fire.

The total weight of the heavy machine gun can be lessened by detaching its tripod and mounting the weapon on its pack frame,

which in turn is attached to the gunner's skis. The gun may be mounted thus in a few minutes in the vicinity of the firing position (see figure).

The taking up of position is extremely rapid, for the gunner is able to crawl forward, pushing the gun ahead of him. When being fired the gun is very stable, owing to the support provided by the skis. With a little practice it is possible to move the gun horizontally and vertically.

This emergency method permits a more rapid and flexible employment of the machine gun in a winter war of movement. However, the precision and density of its fire is slightly less.

The tripod, which is so cumbersome in taking up positions in deep snow, is, nevertheless, indispensable when one is faced with the organization of a defensive position. For final protective fires at night or in fog the tripod alone assures accurate cross fires.

In order to regulate more easily the fire of all infantry weapons in the snow or to designate a target rapidly, it is necessary to carry a few rounds of tracer ammunition. Skilfully employed by platoon and squad leaders, it will be very useful and save ammunition and time.

Over difficult terrain, especially when going up grade, it is well to have explosives and ammunition carried by sturdy skiers, especially trained and provided with sealskins. [Strips of sealskin are attached to the under surface of skis to prevent the skier from sliding backward in his tracks.] This is more satisfactory than attempting to improvise toboggans, which are always heavy, not very stable, and likely to turn over and dump their loads when crossing slopes in a lateral direction.

In constructing defensive positions, our men always ask the question: How thick must the snow be to protect us against bullets?

This depends mainly on the consistency of the snow, which may be dry, wet, newly fallen, or packed. Our latest tests show that a wall 1.60 meters [about five feet] thick, built of blocks of drifted or normally packed snow, offers adequate protection against all infantry projectiles at normal ranges, i.e., 200 meters and over. Even bursts of machine-gun fire were not able to penetrate such thicknesses. The fragments of a mortar projectile which exploded less than one meter from the wall were not able to penetrate it. The outer portion of the wall was destroyed, however, and a hole .60 meter deep and about 1.50 meters wide was made. Only antitank projectiles with delayed action fuzes were able to pierce the same wall without destroying it.

White clothing and camouflage cloths enable our men to adapt themselves and their weapons perfectly to the winter landscape, but their shadows and the tracks they leave in the snow betray their positions to a dangerous degree, especially to enemy aviation. In the majority of cases it is impossible to eliminate these tracks and "simulate" an undisturbed field of snow, especially in the case

of a defensive sector in which a unit has been living and working for several days. Apparently the best method would be to chop up the area around a position by means of a multitude of crisscrossing tracks. Throwing ashes in front of dummy embrasures to make the snow appear dirty would also be helpful in deceiving the enemy.

It will be necessary at the very outset to construct alternate emplacements for the weapons. In our estimation this matter is more important in the mountains than on level terrain, for the premature loss of a gun may be followed by much more serious consequences in a large sector held by meager forces. By a judicious distribution of limited fire means to several centers of resistance it will be possible to obtain a large base of fire and lessen to a certain extent the damage suffered from enemy fire, especially from aerial attacks.

We attempt to confuse the enemy's observation and fire by means of a carefully studied organization and by use of imagination, so as to make him feel, at the proper moment, the full effect of our own concentrated fire.

The Fleet Air Arm and its Future

An article by B. J. Hurren in "The Navy" (Great Britain) November 1945.

FIVE years after what may fairly be termed the most consequential attack in the history of sea warfare, the main weapon of offense then used is already obsolescent and likely to vanish completely from naval air operations.

That is the verdict which informed naval quarters give concerning the torpedo launched from aircraft. It is a verdict which derives from sober analysis of the effect of really large bombs (cf. sinking of the *Tirpitz*) and the striking results of rocket projectiles whose chief advantage over the torpedo is unerring accuracy in aim, as well as depriving target ships of the chance of taking avoiding action.

In 1940 a new vista in naval warfare opened, although the actions by aircraft from the *Ben-My-Chree* in the Aegean in the last war secured success in the air-launched torpedo attack against Turkish vessels.

After the defection of the Vichy French from the Allied cause, it became necessary to neutralize French warships under the orders of Petain and his henchmen. The action at Oran, regrettably necessary, involved an orthodox onslaught by heavy-caliber guns firing from British battleships and an air torpedo attack. But at Dakar, where the French battleship *Richelieu* was the main naval unit, an attack by six Swordfish, borne in the carrier *Hermes*, gave a pointer to the

fate awaiting battleships which faced action without air support.

These Swordfish fired torpedoes at close range and in shallow waters. One torpedo is believed not to have "run" or else to have struck in mud in passage. The remaining five hit the pride of the French Navy and two explosions in critical places caused the *Richelieu* to be crippled.

Four months later, a far more ambitious air torpedo attack was launched, also by Swordfish torpedo bombers. This was at Taranto, on 11 November 1940, by squadrons from the British carrier *Illustrious*.

The details of the attack are well known, and have been recorded in official publications and in enemy archives, since captured. The enemy fleet was closely protected by anti-aircraft batteries of all kinds, both shore and ship, by curtains of balloon cables and anti-torpedo nets. Yet, in the night, a handful of Royal Navy aircraft put out of action three battleships, two being heavily damaged and one beached, as well as striking successfully at smaller ships.

All this was accomplished for the expenditure of only eleven torpedoes, though flare-dropping and bomb diversionary aircraft were used in limited quantity.

It is safe to say that the results were out of all proportion to the effort expended; and if two aircraft and crews were lost, that was a small price to pay for the complete readjustment of the balance of sea power in the Mediterranean in favor of the British Navy. Admiral Cunningham, so long as he had carrier aircraft to support his warships, could be confident of success. Indeed, success followed not long afterwards at Matapan when the naval aircraft with the fleet caused three major Italian cruisers to be brought under the guns of British battleships, and sent a *Littorio-class* battleship limping back to harbor, from which she never again emerged to face battle.

The torpedo, thus launched, went on to further efforts. Used with land-based squadrons, principally at Malta, though from time to time in the Western Desert, Crete, and

Cyprus, the torpedo achieved outstanding results. It accounted for numerous ships of all categories, though main ships eluded action chiefly by taking sea routes beyond the effective striking range of the aircraft. The figures show that naval air arm squadrons at Malta in the critical year 1942 accounted for 160,000 tons of enemy shipping with 36 torpedoes.

Indeed, now that security can no longer apply, one of the most interesting tables which could be issued by the Admiralty would be a comparison of results. Let comparisons be odious if they must; it is almost certain that the aircraft torpedo will show results superior to the actions of any other naval weapon, whether guns or torpedoes, though perhaps the submarines will be able to show very gratifying figures of success.

It is extraordinary, then, that the verdict should be that the torpedo has had its day. First let it be emphasized that on the results of the Naval Air Arm's attacks, the RAF adapted many of its successful bomber and attack aircraft to this duty. The Wellington bomber and the Beaufighter were both produced in torpedo-carrying versions.

Nevertheless, the development of the rocket projectile materially influenced the course of the war at sea. The first success in this sphere is attributed to Swordfish operating in the North Atlantic in the spring of 1943. Then, in an attack against U-boats hunting in a pack and determined to fight off air attack by gunfire, the "punch of a 6-inch cruiser" settled the account of those hit with the new rocket weapon.

At that date, the utmost secrecy prevailed about the rocket projectile; but it was obvious that with development it could become of formidable character. Air commanders accepted the rocket projectile enthusiastically, and while the torpedo was not abandoned, it became the practice to send out land-based air striking forces flying in company armed with torpedo and with rocket projectiles.

Two Dominion squadrons especially featured in this type of action, operating from a Norfolk airfield. Their mottoes were appropriately "Sock 'Em" and "Sink 'Em," the

first going into attack with rockets and the second following up closely (or even making simultaneous attack) with torpedoes. These two Anzac squadrons used the Beaufighter.

Less and less venturing to sea, German shipping was found hugging the French and Norwegian coasts. Rover reconnaissance aircraft—Firefly fighters of the Naval Air Arm—secured a series of successes against such sea traffic. If no targets were available, then useful ground attacks against radar and port installations were brought off.

Now, the function of the torpedo bomber was to provide the Commander in Chief with a striking force. It was clear that the torpedo could not be used against a radar station, and that fleet movements could only be made in secret if the radar stations were "killed."

Hence the rise in favor of the rocket attack, whereby not only could ships be sunk but vital land installations dealt with, especially when they were sited out of range of even the biggest naval guns.

In this, the action by Firefly fighters at Palankan Brandan (Sumatra) in December 1944, figures as one of momentous result. At Brandan the Japs had an oil-refinery plant. The American intelligence service regarded this target as of the utmost importance—so important, indeed, that they felt they would be satisfied if the British could guarantee its destruction, by whatsoever means they chose.

This assurance was given by the Navy, and Firefly fighters with the carriers were given the chance to wipe out the essential plant. It should be emphasized that only one small section of a widespread ground factory was vital; the many storage tanks could be replenished and rebuilt, but the actual refining section could not be replaced for months, even if at all. Therefore, to destroy this, the result would be a complete cessation of fuel supplies for Jap aircraft in the Sumatra and Malaya lands, and a consequent immunity of ship movements.

This task was accomplished in full. The result of that attack was felt right up to the end of the war, and even after. The point is that the salvoes of rockets achieved a concentration and accumulative effect beyond that of precision bombing (even had that been possible in the sultry weather and low mists overhanging the target site) and which, of course, was out of the question for torpedo work.

The result of the action at Palankan Brandan had a marked effect on future air tactics in the Far East. The available targets for torpedo attack were reduced almost to nil, and the cry went up for more rocket fighters and more bombers. Right out of favor went the torpedo bomber, although in December 1941 the Japs had secured major success by the torpedo bombers against the *Prince of Wales* and *Renown*.

It is clear that the rocket is only in its primary stage of development. It is conceivable as far bigger than its present current and effective form. After all, the weight of bombs rose from the general 250-pound bomb to the 22,000-pound "Ten Ton Tessie," an increase of 88 times! Any such comparable increase in the rocket would make it by far the most formidable attack weapon of any used at sea.

The torpedo has had a long innings, dating back to 1865. It achieved phenomenal results against merchant shipping in the last war and in this; and its carriage by air widened the scope of its use. But sober calculation of results indicates that its work can now be taken over by the rocket, in some form or another. From the ships' viewpoint, the advantage of having a weapon that requires virtually no maintenance against one which needs more care than an ailing dog is very considerable. We need not mention comparative costs!

Let us hail in saying farewell to the air-launched torpedo, and look with confidence to the new spirit animating the Naval Air Arm.

The Infantry in Attack

Translated and digested at the Command and General Staff School from a Russian article by Colonel I. Khitrov in "Krasnaia Zvezda" (Red Star) 22 August 1945.

EACH war brings about new developments in the field of armament and noteworthy improvements in the tactical methods of the conduct of operations in which troops have been trained in time of peace. Some tactical methods, not meeting the requirements in the first battles, are abandoned and make way for new ones. In other cases, it is enough to modify them. A continuous process of improvement in the field of tactics, therefore, is always taking place.

The late war called for considerable changes in the tactics of all types of forces. These changes were due, in large extent, to the unprecedented increase in the technical matériel with which the Red Army was provided.

Based on the massed employment of artillery, tanks, aviation, and all other types of technical combat equipment, the Soviet armed forces worked out new methods for the breakthrough of defensive positions. In this kind of operation, the Red Army found the best employment of each arm. The tactics of the infantry were accurately established. The role of such units as the rifle company was clearly defined.

To understand the characteristics of the operations of the rifle company in the breakthrough of a defensive position, it is necessary to bear in mind the general characteristics of the tactics of the Red Army in its breakthrough operations against the enemy defenses on the Karelian Isthmus, at Leningrad, in White Russia, on the Vistula, in East Prussia, on the Oder—in short, in all of its offensive operations during the second half of the war. The breakthrough of the solid German defenses, whether of positional or permanent type, began in all cases after direct contact with the enemy had been established. The approach to the positions was accomplished through stealth, and in most cases under cover of darkness. The areas of departure were organized by

digging trenches, constructing firing positions and shelters, and making passages through obstacles. All measures were adopted to maintain secrecy with respect to the concentration of forces. The infantry attack, as a rule, began at a common signal.

The breakthrough was effected through the joint effort of all the arms. The rifle companies attacked as part of the general mass of infantry, which was supported by large amounts of artillery, tanks, self-propelled guns, and aviation. The engineers also took an active part in the fighting.

In those areas where the outcome of the attack was to be decided, the Soviet forces attained tenfold and even greater numerical superiority over the enemy in point of matériel. Provided with such powerful technical means, the attackers were able to destroy almost all of the enemy's fortifications. This was accomplished normally during the short period of the preparation for the attack.

The hammering of the enemy's defenses, deep in the rear, by our artillery, mortars, and aviation before the beginning of the infantry attack and the support of the attacking wave of rifle troops by tanks and self-propelled artillery created conditions which brought about new methods in breakthrough operations and in the employment of the rifle company in attack. From a gnawing-through of the enemy's defense by means of successive and planned attacks such as the Soviet infantry had studied up to the time of the war, Red Army units changed over during the course of it to a continuous attack, that is, to uninterrupted movement of infantry and tanks behind a barrage of artillery and mortars.

What was the basic reason behind so marked a change in the tactics of the Soviet infantry? It must be found, primarily, in the increased artillery attacking with infantry and tanks. Fifty to sixty guns to a kilometer of front—this was what our pre-

war regulations provided. Two hundred and fifty to three hundred guns per kilometer of front was the actual number concentrated by the Soviet forces to break through the German defensive positions. The fire of the artillery and mortars, the blows dealt by the air force, and the support given by tanks aided rifle units in the breakthrough of defensive positions and enabled them to advance *continuously*, occupying one German trench after the other.

When the breakthrough was based on successive seizures of enemy positions, then it became necessary to assign the company commander to the role of commander of a combat team. Tanks were attached to the company, and one or two batteries of artillery, accompanying guns, and machine-gun and mortar platoons were assigned as additional support. The company commander coordinated the activities of these units just as a regimental or battalion commander would. He planned the operation in detail. Platoons were formed ordinarily in two lines in order that, the nearest attack objective having been taken, a halt could be made, fire means brought up, and the attack resumed with the entire company, thus bringing the second echelon into the operation. This slowed down the attack and reduced the initial impetus of the infantry. As a result of slowness in the development of the attack that had been started, the enemy was permitted to bring up his reserves. The enemy was strengthened and the attack died out.

But the offensive operations of the Red Army in the recent war were very different. The infantry, especially the rifle companies, did not overburden themselves with supporting weapons. Cooperation between the various arms was organized by higher commanders. The rifle company commanders were executors of the plan of cooperation. They were required, in the first place, to be able to take advantage of the effects produced by all the various types of weapons and to occupy the areas bombarded by our artillery before the enemy did, and secondly,

to be able to employ efficiently the company's fire means, organic as well as attached. Company commanders endeavored to coordinate the efforts of the men and fire means within their units (fire and movement of machine gunners and riflemen, mutual support between the platoons and the accompanying weapons, etc.). In this, the company commander possessed complete authority. In other questions dealing with the employment of the various arms, the commander of the company acted in accordance with the plans of the senior commander. He had to understand the tactical elements of the plan, know the signals and other means of communication which the infantry used to contact the artillery and tanks, and indicate his position when requested to do so by the air force.

In considering the different forms of joint action of infantry and tanks, let us note two: the attack of units in the breakthrough of a defensive position and the breakthrough of a fortified position with the rifle company as the nucleus of the assault team. In the first case there is no need of assigning rifle platoons to any particular tank. But, in attacking permanent emplacements the infantrymen must maintain the closest cooperation with the tanks. The riflemen must follow the tanks closely: operate in support of the combat vehicles by shielding them with their fire and advance under the protection of their armor. In the breakthrough of a defensive position the rifle companies should exploit the successes of the tanks, remain close to them, promptly consolidate their gains, and protect them from the enemy's antitank weapons. Some believe that under such circumstances it is impossible to combine the operations of rifle platoons with *specific* tanks; that the mobility of the latter is too great and they may move from one flank of the company to the other in maneuvering along the front in search of the best direction of attack; and that, if each platoon follows a particular tank, it can not maintain its original direction of attack. In the interests of assuring cooperation, however, the mission of the rifle company commander is to stay with the tanks

that are providing support to the infantry, and to assist them with his fire.

Combat experience teaches us that it is not necessary to overburden with reinforcing weapons the infantry engaged in the attack of a defensive position. But rifle troops do need the fire support of mobile artillery pieces. For this purpose, the 76-mm self-propelled gun is best suited. The crew of this gun is protected from bullets and shell fragments. It moves in formation with the rifle units and does not require help from the riflemen when it is necessary to change position under fire. 76-mm guns should not attack ahead of infantry formations, for in this type of support it has proved valueless and caused severe losses.

Battalion and regimental guns placed at the disposal of the company commander are ordinarily able to accompany the infantry at the beginning of the attack. In case of a rapid advance by riflemen, however, they sometimes fall behind. The gun crews are not able to move rapidly across the terrain and need the assistance of one or two rifle squads which the company commander must select from his dispersed attacking units. It is indispensable, however, that the rifle companies be adequately reinforced with a certain number of weapons. This may be achieved by attaching one or two guns to the company before the attack.

Regardless of existing difficulties, the companies should protect supporting weapons under all conditions. Supporting guns and infantry are inseparable in any operation. Their close cooperation is especially necessary in the attack of a defensive position. In cooperation with the weapons of the infantry, the supporting guns assist the rifle company in eliminating the enemy who have survived the artillery preparation. As regards the supporting artillery and mortars, the company commander should know the signals for requesting, shifting, and ceasing fire, how to make contact with the nearest artillery observation post, and how to designate the targets the infantry wants neutralized.

The rifle company has a variety of fire

means. How are they to be used in an attack of a defensive position? There are two opinions with regard to this matter. One group affirms that, during the artillery preparation when hundreds of guns and mortars are pounding the enemy's trenches and the latter are continuously covered by the bursting shells of our artillery, and when the smoke and dust make it impossible to see the enemy, there is no need for the fire of rifles and submachine and machine guns. The riflemen and gunners should advance directly behind the bursts of the shells of the supporting artillery without opening fire. The other group affirms that it is essential that all infantry weapons fire. According to the latter view, for a few minutes before the assault, the infantry should deliver massed fire against the positions of the enemy, regardless of whether the target can be observed or not.

We believe that the second view is the more accurate one. Uninterrupted fire against the enemy's trenches is a necessity. From the first shot fired by the artillery up to the time when the infantry hurls its hand grenades into the hostile trenches, the enemy must find himself under fire. This obliges him to take cover.

In the assault of the enemy's fortifications in the Karelian Isthmus, the fire of the artillery was distributed over the entire depth of the position. The first trench was taken under fire by mortars and flat-trajectory guns. Concealed tanks and self-propelled guns were in the battle formations of the infantry. Before the attack, fire was conducted by tanks, self-propelled guns, and infantry weapons. There was no interruption of the fire in this case. The enemy's trenches and shelters were always under fire. The infantry, trained in the methods of continuous attack, quickly broke through the defenses of the Germans.

This and other examples confirm the fact that the combined fire of artillery and infantry is needed during a certain period of the artillery preparation. In conformity with this, the infantry should bring into

action all its fire means for a few minutes before the artillery preparation ends.

Powerful artillery fire and the fire of supporting tanks combined with that of infantry weapons neutralize enemy defenses, destroy fortifications, and drive into shelters those who have escaped artillery preparations. By these means, rifle companies in attacking a defensive position are enabled to make a continuous attack, to move ahead uninterruptedly until all the lines of trenches in the enemy's defensive zone have been taken or the companies are relieved by succeeding echelons.

When the breakthrough of a defensive position was effected in accordance with the method of successive seizures of enemy strong-points, platoons, companies, and battalions were assigned independent tasks. A gradual and steady increase in the strength of the attack was obtained by means of echeloning the troops—even such subordinate units as the company and battalion. Experience in war brought about many modifications in these battle formations. If the regiments and larger units employed echeloned formation at the time of the breakthrough of a defensive position, the battalion customarily attacked in one echelon. Being in a common formation, battalions, companies, and platoons were assigned similar combat missions. As a rule, these were limited to two or three lines of trenches that had to be overrun by the rifle companies attacking in the first echelon.

The enemy trenches were located at varying distances from our line of departure. The attack of a German defensive position sometimes began at a distance in excess of the standard 180 to 200 meters. That which should be done under such circumstances is to halt within assaulting distance, after having advanced to that point under the protection of the artillery. Battle experience shows, however, that it is preferable not to halt.

Thus, the role of the rifle company and its commander in the breakthrough of a defensive position is different in actual practice from what was formerly believed. In preparing to attack a defensive position the company commander should occupy the line of departure without attracting attention. He should be able to pass, unnoticed, through the lines of the unit that is already there. When this has been done, the position must be organized and camouflaged. It is important that everything be done to enable the company to launch the attack as soon as the signal is received.

Advancing rapidly, the company must coordinate its movement with the fire of the artillery and the supporting tanks. Skilful employment of all fire means is imperative. As soon as the trenches have been reached, the commander selects a few men for clearing them of the enemy. In working its way through the defensive zone, the company quickly closes up into a column or into columns of platoons to pursue the enemy when his fire weakens. The commander, maintaining personal observation of the field of battle, seizes the first opportunity to form the column or columns. This is very important in the development of the attack and the maintenance of its high tempo.

Having overcome the organized defense of the enemy, the companies gain great freedom of maneuver. A broad field for the display of personal initiative is then opened to the commanders. In this stage of the operation the commander of the company needs more powerful weapons (battalion mortars, antitank rifles, and heavy machine guns) with which to crush isolated centers of resistance—combining fire with maneuver, turning the enemy's flanks, gaining his rear and effecting his encirclement.

These, in general, are the principles involved in the attack of a rifle company against a defensive position of the enemy in a breakthrough operation.

Criminal Etiology

Translated and digested at the Command and General Staff School from an article in Spanish by Lieutenant Colonel José C. García Alavos, Infantry, in "Boletín Jurídico Militar" (Mexico) July-August 1945.

DELINQUENCY in the military sense does not, as a rule, present the same problems, nor does it have the same cause, as that of the common penal order.

Common Penal Order

The delinquent person is nearly always psychopathic and dangerous, and his environment, particularly that part of it which has to do with education and morals, exerts a powerful influence on his conduct.

The education of our people, with the exception of the professionals and a few others, is rather limited and consists of a small amount of schooling. This part of our population has been neglected for centuries and, through lack of discernment and a sense of moral and social responsibilities, does not realize what it does. Consequently they have no conception of right and wrong; of what is just, moral, real, ideal, virtuous; of what vice is, of penalties, punishments, pardon, etc.

The word *moral* is difficult to define, since it varies from epoch to epoch and from one nation to another. For this reason, I shall limit myself to the transcription of a few of the definitions contained in the dictionaries.

From the Latin *mos, moris*, custom: Not coming under the jurisdiction of the senses but subject, rather, to evaluation by the intellect or conscience; pertaining to the mental faculties as a whole, in contradistinction to physical. It is the conclusion, consequence, or lesson drawn from any event in particular.

Independent morals: Those based on the concept of good and evil regarded as a natural idea, independent of all positive laws and of all laws of danger.

Natural morals: Those based on the principles of natural laws.

Public morals: Moral doctrines as a whole, those accepted by an entire nation or by men in general.

The Armed Forces

In spite of the fact that our soldiers mostly

come from our humble class (the rural and laboring classes), their military education serves to guide them over helpful paths, tempers their minds, and tries to make respectable men out of them; for the training they get in the Army modifies their customs and habits, a product of the environment in which they lived, and teaches them to respect the rights of others.

A majority of the infractions committed by the members of the armed forces are violations of their own laws and regulations, which have little or nothing to do with the psychology of delinquency. As to the danger of these infractions, it can be said that it is practically nonexistent as compared with that of delinquents of the common penal order.

The statistics in the Office of the Judge Advocate General show the following offenses and the number of persons who committed them over a period of ten years:

Breaking of arrest 6; abandoning their post, command of a ship, or mission 33; abuse of authority 48; threatening a sentry or acts contrary to military honor 25; desertion 6,507; disobedience 41; destruction of property belonging to the Army 11; escape of prisoners or persons under arrest 20; losing Army equipment 11; falsification 3; fraud 3; infraction of duties common to those obliged to serve in the Army 6; infraction of duties of sentinel, watch, or helmsman 1; infraction of military duties incumbent on all soldiers according to their assignment or duty 7; voluntary incapacitation for service 5; insubordination 138; insults to the flag 0; insults to the sentinel or guard 0; voluntarily rendering oneself useless for service 2; mistreatment of persons under arrest or wounded 2; malfeasance of funds 2; concealment of surname, given name, place of birth, age, etc. 1; robbery 12; protection of persons attempting to escape or desert 13; undue retention of salaries 2; theft of Army property

41; sacking 4; treason 1; violence against persons 36; violence against prisoners 4; search warrants 0; trespassing 4; discharge of fire-arms 0; falsification of documents in general 1; striking persons, and other simple or physical violence 0; homicide 18; insults and defamations 1; injury 27; and stealing 17.

Note that the majority of these are purely military offenses and that desertion occupies first place, with 6,507; insubordination second with 138; third, abuse of authority with 48, this being closely allied to insubordination; disobedience fourth, with 41; and the fifth, violence against persons.

The Office of the Judge Advocate General is making a special study to find the cause or causes of desertion, abuse of authority, insubordination, and disobedience, and to take the necessary measures, whether of an educational or other rational nature.

Of offenses that are both of a common penal and military nature, we have in first place, theft of property belonging to the Army, 41; second, injuries, with 27; third, homicide, with 18; fourth, stealing, with 17;

and fifth, falsification, with 3, and fraud, with 3.

Many of those tried for the above-mentioned crimes were acquitted by court martial; others were freed because the judicial proceedings showed an absence of crime. Among these, we have:

Treason; fraud 1; falsification 2; acts against military honor 25; abuse of authority 48; disobedience 28; insubordination 132; theft of property belonging to the Army 34, sacking 4; violence against persons 38; homicide 12; injuries of persons 24 and desertion 801.

Of the remaining, some have been sentenced and others are still awaiting the outcome of their trials.

We can thus see clearly that the infractions committed by soldiers, in the vast majority of cases, are mostly disciplinary, and those of the common penal order are not numerous or serious.

Military education has produced its effects on these citizens in spite of their origin and contact with persons from the outside.

The Art of Teaching

Digested at the Command and General Staff School from an article by Captain Sean Feehan in "An Cosantóir" (Eire) June 1943.

I want to stress one very important point. If you fail to grasp the significance of this point, you fail to grasp the significance of this article. It is this: *The final justification for any army is success in battle.* Now you cannot have success in battle unless you have a well-trained army, and you cannot have a well-trained army unless you have good instructors. Finally, you cannot have good instructors unless those discharging that function have some knowledge of the art of teaching.

I hope you see that point clearly. Most of you aspire to take on the responsibilities of leaders. These responsibilities are very heavy; and one of the heaviest you will have is that

of passing on to others the knowledge you have in your minds in such a way that they will be able to put it into useful effect.

The first thing you will have to do before you can pass on your knowledge is to make it your own by mastering your subject. You must be complete master of your job. You must have a complete knowledge of the functions of soldiering.

Thus, you have first to get this knowledge and you have then to pass it on to others in a presentable way. If you have not a knowledge of the correct methods of teaching it is hardly likely that you will be able to do this, and your responsibility for what may

subsequently happen in action will be heavy. It is possible that men taught by a bad instructor may go into battle with such ignorance of their job as will cost them their lives. Such an instructor is morally responsible for these lives lost through his bad methods of instruction.

We may divide the teaching of a lesson into three parts: (a) *preparation*, (b) *presentation*, and (c) *reproduction*.

Preparation

We will deal with preparation first. You can start off by reminding yourself that you can never possibly know enough about soldiering. Consequently, if you have to teach a lesson or series of lessons, the first thing is to make a study of your subject. Know more about it than you are actually going to teach. The best way to prepare any lesson is really simple. Sit down and read through the lesson, making a list of all the important facts of the lesson. When you have these five or six facts listed, the next thing to do is to go back over these facts and ask yourself how best you can present them to the men. The important thing to remember is that when you go back over these facts a second time you do so keeping in mind how best you can interest the men in them.

Next, pick out the questions—the good, intelligent sort of questions—that you are going to ask the class, and also try to visualize the questions the class are likely to ask you.

The next advice I am going to give you may seem fantastic. When you have your study completed, sit back, close your eyes, and try to conjure up your class in your imagination. See them as though they were actually before you and go through the lesson point by point as you intend to give it. Try to visualize the reactions of the men. You may find this hard to do at first—as we are apt to find everything novel difficult of accomplishment at the first attempt—but with practice you will find it comes quite easily. You will be surprised how confidently and effortlessly you will be able to give the actual lesson the following day.

Presentation

We now come to the second phase: the actual presentation of the lesson to the class. The first thing you want to do here is to collect all the equipment that will be needed for the teaching of the lesson—weapons, maps, diagrams, blackboard, chalk, models, photographs, etc.

Another little point to remember about the location of the class is that you want to position the men where they will least be exposed to distraction. No matter how well-intentioned the men may be, a lesson is still a lesson, it is work, and there is always the desire to withdraw the attention from what we have to do to that which we want to do.

Next, arrange the class in a proper manner. You will have noticed in the Army, and you will remember from your school days, how reluctant men or pupils are to come up to the front of a class. They herd at the back, very likely because they feel that if they come to the front they will be in the instructor's eye for any question that may be coming or else because it will interfere with their intention of paying as little attention to the lesson as possible. Do not let this happen. Fill up your front seats or rows. If it is a practical lesson you are going to teach, gather the men around you in a circle or semicircle where they can both see and hear all that is going on. Make sure the men are comfortable—but not so comfortable that they will fall asleep.

Now we come to the really important point about teaching a lesson. You all know you have five senses: sight, hearing, touch, smell, and taste. We may look upon these senses as five roads along which knowledge and information is conveyed to the mind. Imagine a man without any of these senses and visualize what he would be like. Of course you can see that such a man would be totally ignorant of the world around him, for everything we know of the external world comes to us through these sensory channels. Now suppose this man by some miracle were to come into possession of the sense of hearing. You can see at once that a road has been opened into

his mind. He is capable of acquiring some knowledge. If you were teaching him the rifle he would be capable of learning something about it. Then suppose he were to acquire the sense of touch. He would be capable not merely of learning the names of the parts of the rifle, but of feeling and touching them and appreciating something of their characteristics. Lastly, if he were to acquire the sense of sight he would then be capable of seeing what he had previously heard about and felt. He would be capable of learning all about the rifle.

The moral of this little illustration is that the more senses you appeal to in giving a lesson the better and more quickly will the class grasp it. As far as the Army is concerned the three important senses are those of hearing, sight, and touch. The art of teaching anything to a body of men is: firstly, to tell them all about it; secondly, to show it to them; and thirdly, to get them to touch it, to do it for themselves. This is the kernel of all instruction. For example, if you were teaching a lesson on war gases, you would first of all tell the class all about the gases, then you would show them samples of the gases in bottles, and finally you would allow them to smell the gases. So use all senses if you can.

When you are teaching a lesson, stand out in front of your class and tell them what exactly the lesson is about. Do not begin by saying: "What we are on for this period is . . ." or even: "What I am going to teach you is . . ." Say rather: "What you are going to learn is . . ." This transfers the action from the teacher to the pupil; and though you may think it trivial, I can assure you that there is good sound psychology behind it.

Of course, you have heard it said that we remember those things in which we are interested. Or, to put it another way, where your interest is, there is your memory. This is very true. Aim, therefore, in your lessons at constantly keeping the interest of your class alive. Illustrations, stories, and occasional jokes will help to do this.

Now, after telling your class what the

lesson is about or what you are going to do, you next show them how to do it or do it for them. If it is a practical lesson on, say, rapid firing, show them how actually it is done. Do not say before you begin: "I am now going to give you a demonstration of rapid firing." Be simple. Say: "I will now try to show you how to do this." If it is a lecture you are giving, utilize a blackboard. Give them plenty of diagrams.

Divide the lesson up into easy stages according to your preparation. Of course, if you are giving a lecture it is somewhat different. In a lecture you must rely more on illustrations and stories to keep alive interest; but in a practical lesson you can keep the men's interest alive by making them find out a lot of things for themselves.

Do not start off using big words the men do not understand. Some seem to think they will impress the men more by using big words. They are wrong. They neither impress nor teach. Use simple language, for it is the most effective in the long run. The men will not be impressed by your language but by the knowledge they can acquire from you. Be simple and clear.

Another point to remember is: Do not be sarcastic. If you adopt a bullying or sarcastic attitude, the class will distrust you; and if they do this, they will derive no benefit from your instruction. These points I have put before you are just a few of the more important ones about the art of teaching to which you ought to pay attention. There are many more; but if you pay attention to these, it is likely that you will pay attention to the others.

Reproduction

Finally, we come to the third phase of the lesson: the reproduction. This simply means the putting into effect by the pupils of the point, moral, or purpose of the lesson. There is no use learning something if it is to bear no fruit; and the final test of a lecture or lesson is whether the pupils are able to apply what they have been taught.

Before you leave a lesson make sure that the men have grasped it and can practice

what they have been taught. If you have been teaching men how to aim, test them and see if they can lay a correct aim. If you have been lecturing on an attack on a house, go out onto the ground and give the lecture effect. Put the class through an attack on a house. It is very important that what is taught should be followed immediately by an application on the ground. If we do not give immediate effect to what we have just learned in a lesson or lecture, the chances are that half its value will be lost.

It is during the putting into effect, during the reproduction, that you can correct faults. Make sure that you do correct faults and that you allow absolutely no fault to pass unchecked. Otherwise it will become a habit and will cling to the man all the days of his life.

Another part of reproduction is the asking of questions. The first kind of questions are those the class will ask you. Try to answer them to the best of your ability. If you are asked a foolish question do not snub or try to score off the questioner. The question may mean a lot to him. There is another type of question which is asked by a man who already knows the answer but who wishes to show the instructor how much he knows by asking the question. You will be tempted to "sit" on such a person, but resist the temptation. It is a bad policy to "sit" on a questioner.

Then there are the questions you are going to ask the class. There are a number of wrong ways of asking a question, but there is only one right way. Do not, for instance, ask a question in such a way that you give half the answer, leaving the class to supply merely a word. This is a sign of mental laziness in an instructor and it makes for laziness in a class. Again, do not ask questions and allow the class to answer them in unison. The instructor is lost by this method. If you allow the class to answer together, it means that a number of them will just make movements with their lips and will not know the answer at all.

Use the right method. State the question clearly, pause, look around the class, and pick out someone and put the question to him. During the pause the whole class, not knowing who is to get the question, is thinking of the answer.

Conclusion

In conclusion, I urge you to become good instructors. If you have acquired the art of teaching you can pass on your knowledge and the men under you will become good soldiers and good fighters. The moral guilt of a bad instructor will be measured by the corpses of his comrades on the battlefield. Yours is a vital job. Take it seriously. Get down to it and determine that you will be satisfied with nothing short of excellence.

Of the requirements for military power, a high morale is the most important in war. A troop armed with modern equipment and having an efficient command is worthless if at the first call it lays down its weapons and flees.

—Michel quoted from *Revista del Ejército*,
Marina y Aeronáutica, Venezuela